

TIME AND MIND

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TIME AND MIND

The History of a Philosophical Problem

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Only through time time is conquered.

T.S. Eliot, *Burnt Norton*, II

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PREFACE

Can time exist independently of consciousness or mind?

This book is about the history of this question and the answers that have been given. Aristotle was the first to ask whether time would exist if there were no mind. The question still occupies the minds of philosophers of very different persuasions today. That is hardly surprising, for no matter how peremptory and ineluctable time may seem to be, it was just as natural to call its absolute, ineluctable reality into question, not so much because everything can be called into question, as because time invited such questioning more than other matters did. Compared with the existence of space or matter, the existence of time has always had something fragile or paradoxical about it, sometimes almost as though it were not genuine at all. Do we perhaps create time ourselves with our experience, our memory, our expectations?

Strictly speaking, of course, it was not always the same question. It already makes a difference whether one is talking about mind, soul or consciousness. Consciousness is the most elementary given, while soul and mind presuppose much more than that. But even when the same word was used, that was no guarantee of identical meaning. Ideas about mind, soul and consciousness varied over the centuries (and often at one and the same moment), while time was taken to refer to different things too. Moreover, all kinds of subsidiary and further questions automatically arose. If time is dependent on mind or consciousness, how and why is it so, and in which respects—and why not in other respects? So many answers had the character of ‘Yes, but . . .’ or ‘No, except . . .’, and did not necessarily refer to the same thing.

It is thus debatable whether the question as formulated in the first instance really does have a proper history.

I believe that it does. The following chapters will give sufficient grounds for this belief. Although there is certainly not one and only one issue, there is a coherent cluster of issues. It is striking how many aspects and considerations regularly recur, how much continuity there is amid the unmistakable discontinuity, how many unbroken lines can be detected in this tangle. It is rewarding to note how

familiar ancient ideas may be, as well as to encounter strange speculations. I hope to present all of that.

At times, of course, it proved necessary to touch on related matters. Sometimes a few general characteristics of a philosophical approach are discussed to bring out the purport of question and answer. This is true, for example, of Plotinus, Locke, Berkeley, Husserl, and Heidegger. On many occasions too, the philosophy of time in a more general sense enters the discussion. The advantage of this is that, although this book is not specifically about the history of the philosophy of time as a whole, it does present a fairly detailed picture of that history.

Occasionally it even provides something more than that. I have ventured on a couple of excursions in cultural history, right at the start of Chapter I but above all in the whole of Chapter IX. On the other hand, I have avoided the psychology of time. I realise that the title of this book might lead one to expect a treatment of the history of the psychology of time. That is certainly not what it is about. Important developments in that field (in the French-speaking world, for example, connected with the work of the psychologists P. Janet, J. Piaget and R. Fraïssé) are not discussed. Even philosophical psychology had to be left aside in most cases. The present book is about the manner of existence of time itself, not about our knowledge or experience of time. In so far as this knowledge and experience come up for discussion (as with Augustine), it is in connection with the main question.

A final limitation is that the history told here is the history of a part of Western philosophy. I am aware that the topic could have led to interesting comparisons with oriental philosophers. More in particular, Indian philosophy presents similarities with its reflections on the real or illusory nature of time. I regret having had to leave that avenue unexplored for obvious reasons.

The history of Western philosophy had enough problems in store for me. At the same time, one of the most attractive sides of this enterprise was that I had to delve into thinkers who were relatively unknown to me until then. In most cases I have come to appreciate them more; in only a few cases was the closer acquaintance disappointing.

I have been fortunate to receive sound advice at the final stage. I would particularly like to thank my colleagues Theo de Boer, Jan Hilgevoord, Theo Kuipers, Arjo Vanderjagt and Theo Verbeek for

their comments on the chapters that they kindly agreed to read. I owe a heartfelt debt of gratitude to my wife Simone Mooij for her comments on the whole book—and for her help and interest from the very start.

For the English version of this book I have been through the whole text again with a critical eye, making small changes or additions in many places, and substantial ones at a few points. By far the most important addition is to be found in the Epilogue. The text on pages 264–268 is largely new. I hope that my own conclusions and views are clearer as a result.

During this stage I made use of valuable suggestions by Prof. A.P. Bos (Free University, Amsterdam), Dr P.S. Hasper (University of Groningen), and Emeritus Prof. J.D. North (University of Groningen; now in Oxford), in connection with chapters III, II, and IX respectively. I thank them for their comments and for our pleasant conversations and correspondence.

It is with great pleasure that I look back on the amicable cooperation with Dr Peter Mason. We have gone carefully through the whole draft translation together and combined efforts to find a solution in problematic cases. I have particularly appreciated his willingness to grasp my intentions, his linguistic dexterity and inventiveness.

I would also like to thank the Netherlands Organisation for Scientific Research (NWO) for providing a grant for this translation.

When this grant was made in the spring of 2003, Prof. A.J. Vanderjagt offered to include the book in the series “Brill’s Studies in Intellectual History”. I am grateful to him for this token of appreciation and am delighted that the book is now made available in this way.

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I would also like to thank Em. Querido's Uitgeverij BV for permission to reproduce the translation (by Henrietta ten Harmsel) of part of a sonnet by P.C. Hooft on page 3.

CHAPTER ONE

INTRODUCTION: HOW OLD IS TIME?

Many allegories present Time as a winged, almost nude old man. He usually has an hourglass, often holds a sickle or scythe, and is sometimes accompanied by a serpent or dragon biting its own tail. Representations of this kind became popular from around 1400.

Time had been depicted with wings before that, but in most of those cases he was still young. The main source for this was probably the ancient representation of the young Kairos, the personification of the decisive but fleeting moment, the golden but brief opportunity. According to the poet Ion, he was the youngest son of Zeus. He had wings on his shoulders or heels. The major prototype was a statue by Lysippos; it is no longer extant, but has often been copied and represented. In addition there were the representations of Aion, the personification of uninterrupted, infinite time and in that sense of eternity. This figure was often winged too, was attributed various origins, and appeared in all kinds of guises: human or partly animal, young or, in a few instances, old. The cyclical character of this universal and eternal time was emphasised by an appropriate attribute, such as a wheel with the zodiac or a serpent.

The ordinary Greek word for time, however, was *chronos*, which was also personified now and then. In such cases the figure of Chronos represented time in its more actual, human sense. In Euripides he was the father of Aion, but once again he was often portrayed as a young man. Early on, however, Chronos was brought into connection or even identified with the Greek god Kronos, who in turn was later identified with the Roman god Saturn. Saturn was usually represented as an older man. It is from this double connection that the figure of Time as a somewhat disagreeable old man eventually seems to have emerged. The first evidence of the connection between Chronos and Kronos is in an extant fragment of Pherecydes, who lived in the sixth century BC. That proved to be incidental for the time being. In a text that has traditionally been attributed to Aristotle, *De Mundo*, the fact that Zeus exists throughout every period of the

world is taken to explain his descent from Kronos or Chronos, but most scholars believe this work to have been written one or more centuries after Aristotle.¹ Other, more systematic testimonies, in so far as they are extant, do not antedate the Roman era. Plutarch (ca. 100 AD) was an important source. Visual material was equally eloquent. Images on coins and elsewhere indicate that the connection between Saturn and Chronos must have been fairly common by the late Roman era. The fact that the Saturnalia were held around mid-winter may also indicate a relation between Saturn and time.

As the tutelary deity of agriculture, Kronos had the sickle as one of his attributes; he had also made use of it to castrate his father Ouranos. It was a useful ingredient as a metaphor for time, as the scythe was later to become. So was the swallowing of his children by Kronos: time destroys what it brings forth. It is conceivable that this is also the background to Ovid's characterisation of time as greedy, eager to devour things (*edax rerum*).²

The history of the various elements of the traditional allegory of Time with which I began thus goes back a long way. Nevertheless, it only emerged definitively on a large scale towards the end of the Middle Ages. In an essay on the personification of Father Time, Erwin Panofsky suggested that it was above all the illustrators of Petrarch's poem *The Triumph of Time* that must have been the decisive factor. They needed a less attractive figure than the medieval representations: 'Small wonder that the illustrators decided to fuse the harmless personification of 'Temps' with the sinister image of Saturn. From the former they took over the wings, from the latter the grim, decrepit appearance, the crutches, and, finally, such strictly Saturnian features as the scythe and the devouring motif'.³ In a certain sense it was a repetition of what had already taken place before. They set the trend, and their image of Time remained popular down to the eighteenth century. A famous example is Nicolas Poussin's painting from around 1640 *Il Ballo della Vita Humana* (Dance to the Music of Time), where Time, an old man with a beard and colossal wings, is shown providing musical accompaniment on a lyre to

¹ For the passage in question see *De Mundo*, ch. 7, 401a 16–17.

² Ovid, *Metamorphoses* XV, 234.

³ Erwin Panofsky, 'Father Time' in *Studies in Iconology*, p. 80. On Petrarch's poem see below, pp. 113–114.

the main scene: the dance of Poverty, Labour, Wealth and Pleasure. A putto holds his hourglass, and there are various other symbols of time too. Within a short period, Time had been transformed from an attractive adolescent or young adult into a somewhat grotesque, sometimes good-natured but often sinister winged old man. Moreover, the scythe was sufficient in itself to suggest an unmistakable connection with the popular allegory of death as the Grim Reaper.

As Time borrowed certain elements from Kronos, so could attributes of a god of time be attributed to images of Kronos or Saturn. For instance, in the impressive sculpture of Saturn eating his children by Artus Quellien in the Royal Palace on the Dam in Amsterdam, an hourglass lies prominently among the agricultural implements and products at the feet of the god.

Of course, this development left its mark in literature too. One example is a sonnet by the Dutch poet P.C. Hooft (dated 17 February 1610) in which the poet presents Time as a 'swift-flying greybeard'. The octave runs as follows:

Swift-flying greybeard who on wakeful, tireless wings
Goes cutting through thin air, who never strikes his sail
And travels with the wind while all pursuers fail,
Arch enemy of rest, by night and day all things
Are swallowed, torn, destroyed by your hot, hungry glee,
Unconquerable time; the strong, who seem so great,
You turn and overthrow—the ruler with his state.
Too fast for everyone! Then why so slow for me?

Here the poet effectively brings out Time's haste, his voracious greed and the devastating effects of his passing.⁴

This Father Time does not have a scythe or sickle. They are more appropriate to a seated or standing Time. He lacks an hourglass too, although surprisingly enough this instrument continued to be *the* temporal attribute of Father Time, in spite of the fact that the mechanical clock had been invented and was in widespread use by the time that the image of Father Time became established. The clock was

⁴ The contrast with the sestet, in which the poet describes how time drags as a result of his desire for the coming of his beloved, could not be greater. The English translation is by Henrietta ten Harmsel and is taken (with a change in line 3) from her essay 'P.C. Hooft in Translation', pp. 87–88, which includes the Dutch original. On the original cf. also C.A. Zaalberg, *Uit Hoof's Lyriek*, p. 65.

thus available as an attribute, but was only used in that manner very occasionally. Perhaps it was considered too modern for the still strongly mythological and at any rate allegorical context, although the hourglass was a post-classical invention too—or was the hourglass more attractive because of the suggestion of the end, the visible running out of the available time? However that may be, the fact remains. Still, there are exceptions. An interesting one is the allegorical poem *The Pastime of Pleasure* by Stephen Hawes from the beginning of the sixteenth century, in which Time is a winged and feathered old man who bears a clock instead of an hourglass.⁵

Time is thus an old, in fact a very old man. It is true that sometimes, as in the Hooft sonnet, he is still on the move and lively—the destroyer of all is himself indestructible—but nevertheless he is old. Time itself, that is, non-personified time, is not young either, of course. But how old is time? When did time come onto the scene? When did its existence begin?

The latter question recalls the simple question with which Quine formulated the central problem of ontology: ‘What is there?’ He notes that the equally simple answer is: ‘Everything’. This answer would even be accepted by everyone. All the same, this answer does not bring the original problem any closer to a solution.⁶ Something similar applies to the question of the existence of time. After all, the simple and irrefutable answer to the question ‘When is there time?’ is ‘Always’, but in this case too, it does not solve anything. Although everyone could agree with this answer, not everyone would mean the same by it.

That is true in an exemplary fashion of Newton and Leibniz, who engaged in several controversies around 1700, including a famous one on time. Newton was the authoritative and extremely influential protagonist of the notion of absolute time. He argued that certain movements could be shown not only to happen relatively to certain objects, but also to have an absolute character. Such absolute movements required an absolute space and an absolute time. This led him to draw a distinction in a famous passage of his *Principia* (1687) between relative, phenomenal, conventional time, on the one hand, and absolute, true, mathematical time, on the other. The latter flows

⁵ See below, pp. 117–118.

⁶ W.V.O. Quine, *From a Logical Point of View*, p. 1.

evenly on by nature independently of anything outside it. This absolute time, also called duration, has neither beginning nor end and is operative everywhere, just as absolute space has no limits and every part of it exists at every instant. So in Newton's case the answer 'always' to the question 'When is there time?' has eternal value; it implies unboundedness and infinity. Time is thus for him infinitely older than the world. Time existed 'already always' and will continue to exist 'for ever'.

Newton's mentor Isaac Barrow had already propounded the same absolutist view of time, and even in earlier centuries there had been steps in the same direction. It was the success of Newtonian physics, however, which made it so influential. Nevertheless, it was not long before objections were raised. Leibniz was one of the principal opponents.

Leibniz took a relational view of time and space and vigorously opposed Newton's notions of absolute time and space. These notions imply that the world could have been created at a different moment and in a different place than actually happened, and according to Leibniz such a shift of the world in time and space is not a real shift. The idea that the world could have been created previously or elsewhere is a meaningless idea. To start with, God would not have had sufficient reason for that, and it would not have made the slightest difference either. Or rather: there could not have been a sufficient reason precisely because it would not have made any difference. The two versions of the world would have been completely identical.

Time, according to Leibniz, is linked to events, to change. It is only through change that time arises. Time is for him an order of succession, just as space is an order of coexistence. Neither of them would be able to exist in a full, actual sense in an empty universe.

Towards the end of his life, in 1715 and 1716, Leibniz reasserted these views in opposition to those of Newton in his famous correspondence with Newton's follower and assistant, Samuel Clarke, occasioned by a dispute concerning the omnipotence and omniscience of God. Leibniz accused Newton of having underestimated these divine capacities. After all, time and space do not exist independently of God; it was not until 1713 that Newton had explicitly admitted that they are inherent in God. For Leibniz, on the other hand, a creation of time and space without a creation of the world was inconceivable and therefore impossible for God too.

The answer 'always' thus meant something very different to Leibniz than it did to Newton. It meant 'as long as the world exists'. That was not so long in his day. On the basis of biblical evidence, the world was estimated to be about 5,500 years old. According to a calculation which was influential at the time, the creation took place in 3,950 BC, according to another in 4,004 BC, and according to the Jewish calendar in 3,760 BC. John Locke assumed the date of 3,950 BC in his *Essay concerning Human Understanding*. When he was completing it in 1689, he thus took the world to be 5,639 years old. Leibniz may have had a different calculation in mind, but it cannot have made much difference. For him, time was as old as the world.

Of course, other cultures and religions had very different ideas. Like Leibniz, Aristotle had defended the view that there can be no time without change, but he also argued that the succession of changes cannot have a beginning or an end. That was a reason for him to think that time has no beginning or end either. His view on the age of time was thus like Newton's, although with regard to the essence of time his views were closer to those of Leibniz.

Modern views are determined to a large extent by modern science. The theory of the big bang as marking the beginning of the universe is the dominant one. That beginning is supposed to have taken place between 10 and 20 billion years ago, according to the most influential calculation about 13.7 billion years ago. The time and space in which we exist are also taken to have arisen then. That is a long time ago, much longer than a period of some 6,000 years, but it is still a finite period. So the modern, but in principle still Leibnizian theory of the age of time remains in conflict with those of Newton and Aristotle.

However, there is a radically different possibility, in which time is taken to be dependent on mind or consciousness. In this case, the argument is that time in the fullest sense of the word cannot exist without mind or consciousness. That it cannot be experienced or known without mind or consciousness is obvious since that applies to everything, and is thus not at issue here. There must be special reasons why the object of that experience or knowledge, time itself, cannot exist without mind or consciousness.

Kant was one of those who saw things this way. He was even one of the most systematic and extreme defenders of the view that time depends on mind and can only exist by virtue of mind. It is

enough here to recall his conclusion: time, like space, is a form of intuition. It is thus one of the conditions of our perception and knowledge of the world. In itself, that is, outside the human subject, or more generally, outside a being that shares our fundamental ways of perceiving the world, time does not exist. Other philosophers adduced different reasons, which often led them to adopt different conclusions. Aristotle was the first to explicitly raise the question of whether time can exist independently of mind, and his answer too was in the negative.

The view that time can only exist on the basis of mind or consciousness makes the age of time a good deal less than was assumed above. According to the account in Genesis, it does not make much difference and is a question of a few days, but things are very different when seen from the perspective of modern science. The difference then becomes enormous, because the age of the earth is taken to be about five billion years, that of life on earth somewhat less, and that of conscious life less still. It is uncertain at what point in evolution consciousness arose: at the latest with the first anthropoids, probably much earlier, but at least as probably very long after the emergence of the first single-celled organisms. At a rough estimate we can talk about two or three billion years. In that case, consciousness would only have existed during the last ten to twenty per cent of the life of the universe. If mind is taken more narrowly to be human mind, then time has existed at most for only a couple of million years and is thus some 1,000 times younger. Of course, it is quite possible that life has developed at a faster pace elsewhere in the universe and that consciousness and mind have been in existence there for a good deal longer. If, however, it is true that the universe originally consisted of the elements hydrogen and helium; that the heavier elements, including carbon and oxygen, only emerged after nuclear fusion in the interior of stars; that these heavier elements were only released after the termination of the life-cycle of those stars, when their material remains were scattered through space; that they were biologically useful at the earliest in the new heavenly bodies that arose from those remains; that life, in whatever form, is not possible without such heavier elements; and that biological evolution is everywhere a non-directional process based on chance mutations, and thus a protracted one—if that is all true, then any difference from the developments on earth cannot be so great, at least when measured on a cosmic time-scale.

However that may be, according to this third view time is at most as old as the conditions for its existence in the consciousness of living beings. Of course, when this conclusion is formulated as an answer to the question ‘When is there time?’, it still squares with the common standard reply ‘Always’. Now, however, not a single extra implication is applicable and the common answer has only its minimal significance. It means no more than ‘at every moment’, and is thus a tautological answer. But since the view concerned is anything but tautological, it has become misleading at the same time. For if time really is dependent on consciousness, that does not rule out the possibility that consciousness projects time onto situations in which there is no consciousness. Looking backwards, we can speak of the period that preceded the origin of consciousness, while looking forwards we can speak of the period that will follow after the disappearance of consciousness. Our time scale is then extrapolated, as it were. In fact, an appeal to that possibility was already made in the previous paragraph. Seen in this light, billions of years may have passed without time’s (coming into) existence. Thus in this case, contrary to the intention of the standard reply, time is *not* ‘always’ there.

This is all the more the case if time is taken to be dependent on consciousness only in certain respects, while some aspects of time are allowed to exist independently of consciousness. This possibility is explored in more detail in the following chapters, which describe how in the course of time philosophers have conceived the (in)dependence of time on mind or consciousness. Of course, that history only makes sense against the background of the history of the philosophy of time in general, which is why I have briefly outlined that background each time. I have also tried to show the connection with other relevant ideas, circumstances and developments on crucial points. Aristotle’s predecessors could not be ignored, various intermediate and transitional figures had to be discussed, and the conception of time in its generality had to be taken into account in each case. That is why this book has up to a certain point become a history of the philosophy of time, though from a particular perspective. I have limited myself to the history of Western philosophy. Of course, there are points of similarity with other cultures here and there, more in particular with Indian philosophy in connection with the notion that time has no existence and is an illusion that is dependent on consciousness anyhow.

So the finesses will come later. This, however, is the place to deal with the controversial role of consciousness in the emergence of time in a little more detail, detached from the historical development. I shall do this by means of a thought experiment. After all, we can try to imagine what happens to time if consciousness, and with it the mind, disappear. This is the most direct way to discover in which respects the thesis of the dependence of time on consciousness imposes itself, in other words: what the most consciousness-sensitive aspects of time are. In a certain sense this project is paradoxical, because it involves trying to imagine something on condition that there is nothing that can do the imagining. It is therefore best to regard the latter situation as the result of a gradual withdrawal of consciousness from existing reality, in order to finally determine this result from outside.

What is left is at any rate an insipid world lacking scent, colour and even light. Objects or organisms can continue to register matter or radiation, but they can no longer have a conscious experience of a specific sort. Pleasure and pain, love and hate are eliminated, as well as memory and expectation. Nothing and nobody would have any idea of the passage of time. But what is the situation regarding time itself?

There is a lot to be said for the standpoint that time, albeit in mutilated form, still remains, though it is difficult to determine how and why, for two mutually conflicting conclusions impose themselves, both of which are intuitively convincing.

The first is that only the present is left. The past can no longer exist, for under these circumstances it is 'always' gone. We can say that traces of it must have been left, but those traces have become pure present. If nobody remembers where those traces came from or is able to interpret them by determining their source, they mean nothing. Perhaps it is not even possible to say meaningfully that the past is gone, since the notion of the past simply does not exist under these circumstances. At most it has become an empty shell. As for the future, the situation is even clearer; it is not there. Strictly speaking, there is no change either, for every situation that is succeeded by another presupposes a present that becomes past and a future that becomes present, but this past and this future do not exist. There is nothing from earlier or from later that can be compared with something from now. There is only now.

But then a second, opposite conclusion imposes itself. Does 'now'

not imply an entity that is aware of that 'now', in other words, consciousness or even mind? Can the present exist without something or somebody to realise that present, to be aware of it, something or somebody that at least has a sense of 'now', refers to the present in that way, and thereby isolates it from the entirety of all moments? What would be left without such a conscious entity on the basis of this second conclusion is just pure succession without any present, and thus without past and future either. One event follows another in a long, perhaps infinite series, but it is impossible to say which events have already taken place and which are still to come. There is no privileged present moment that distinguishes past and future; all moments, all momentaneous situations have equal weight in a series. World history becomes a panorama of juxtaposed situations.

If we combine these two conclusions, we seem to recover time in all its fullness: present and succession, from which past and future can be deduced. This is an optimistic idea, however, for it can equally well be argued that the two conclusions are in fact mutually incompatible and, when combined, cancel each other out so that we are left with nothing. After all, the first denies succession (and thus the result of the second conclusion), while the second denies the present (and thus the result of the first conclusion).

It is of course doubtful whether these two more or less intuitive conclusions are equally strong. My own opinion is that the second is stronger than the first. That only the present exists, without past or future, as the first conclusion runs, already has something self-contradictory about it because these three notions are too closely connected with one another. It is acceptable that temporal change would be lost, but that is also recognised in the second conclusion to a certain extent because its so-called succession is, when examined more closely, not a genuine, complete succession any more. The second conclusion thus contains what is acceptable in the first, albeit in transposed form.

Moreover, it fits well with natural science. The fundamental physical laws contain no reference to the present, not even to any special moment. They include time as the variable t , but only implicitly (in differential equations, with derivatives to t as an independent variable), not explicitly. So unlike geology or astronomy, for example, these fundamental laws do not describe how the world is, was or will be at any particular moment. Specific values of t are irrelevant,

it is the differences that count. The laws in question say how the world changes or can change under certain conditions, as well as how quickly or slowly that change takes place. Even the direction from prior to posterior is called into doubt by some physicists, for the basic physical laws are not only silent about the present, but they do not have a preferred temporal direction either; with a few exceptions, they are symmetrical in time and insensitive to the replacement of t by $-t$. In short, the temporal relations come more and more to resemble spatial relations, and without consciousness even the direction of time, 'time's arrow', may disappear too.

This is discussed in later chapters, but there will be no last word. The advocates of the first conclusion need not admit defeat. The conviction of the unique reality of the present maintains an almost unshakable obviousness in spite of everything. One is not bound a priori to accept the worldview of the physicists. It is therefore hardly surprising that both standpoints still have adherents today. The acceptance of the unique reality of the present has even been given a name: presentism; the alternative view, which concerns the coexistence of all moments and situations, could therefore be referred to as coexistentialism. And there are also the robust realists who want nothing to do with the thesis of the dependence of time on consciousness in whatever respect.

However that may be, there are important reasons to suppose that time in the full sense cannot exist without consciousness, and perhaps even without mind. There are different, partly incompatible reasons, and it remains debatable how much weight they carry. The problem arises already during a preliminary, intuitive consideration of the matter. No wonder that it has played a key role in thinking about time.

CHAPTER TWO

HOW IT STARTED: FROM PHERECYDES TO PLATO

If one goes back in the history of Western culture to look for views on the origin of time, one of the oldest on record is a fragment of Pherecydes of Syros from the sixth century BC. Like his younger contemporary Pythagoras, with whom he may have been in contact, he was believed to possess miraculous powers. Pherecydes was the author of a work on the origin of the world which was known for a long time in antiquity, but is only preserved today in a few fragments and paraphrases.

One of those fragments is about time. The original work must have started with it, for Diogenes Laertius and others call it the opening phrase: 'Zas and Chronos always existed and Chthoniē'. Chronos, Time, appears here as one of three naturally present and eternal beings. 'Zas' is probably a variant of 'Zeus', while 'Chthoniē' refers to the earth. 'Chronos' is here generally taken to be a variant of 'Kronos'. Perhaps Pherecydes liked etymologies and that is how the god Chronos originated.¹ At any rate, at this early stage the question of the affinity or even identity of Kronos and Chronos is already raised. The idea was to be developed later, as we saw in Chapter I.

It is striking that there is no reference to an original chaos, as in the cosmogony of Hesiod. Right from the start, there is apparently a certain ordering in which, besides the opposition of Zas and Chthoniē, who can be regarded as representing heaven and earth respectively, Time also plays a (possibly mediatory) role. Later passages in Pherecydes' work must have described how fire, wind (or breath) and water originated from the seed of Chronos, as well as

¹ A few specialists, including H. Fränkel, have claimed that the fragment in question has been incorrectly transmitted and that the original text must have read 'Kronos' and not 'Chronos'.

the marriage of Zas and Chtoniē. Further on still in his account, Chronos probably became Kronos, since the latter engages in a fight with Ophioneus.

Time apparently has no beginning in Pherecydes' cosmogony. It has always been there, and in spite of the later change of name, it will always continue to exist. We can recognise something of Newton's view in mythological form: time is eternal, without beginning or end. However, this has nothing to do with a concept of time as evenly flowing onwards. Moreover, time is here not an isolated phenomenon but it is connected with Zas and Chtoniē, although the nature of that connection is unclear. The existence of Chtoniē does at least imply a certain spatiality, so space is also at issue here, albeit probably in a limited form; there is no reason to think of an unlimited space here. All in all, it seems that this time and this space are never alone and never empty; probably they could not exist if they were.

The Ionian philosophy of nature was already under way during the life of Pherecydes. Thales of Miletus may have been a contemporary, though he was probably somewhat older. Of his immediate successors, Anaximander at any rate voiced an opinion on time; at least, there is a quotation pointing in that direction in the work of the philosopher Simplicius, who lived in the sixth century AD, that is, about 1,100 years later. According to that quotation, creation and destruction are inextricably linked, since things pay compensation to one another in a manner that is laid down by time. That manner may refer to a period, such as the seasons (summer is 'paid for' by winter). That seems to imply that time is connected with the cosmos, even has some say in what happens there, and is at least as old as its oldest components, but what else? The text has been endlessly discussed, but it is too brief for us to draw more specific conclusions on this point.

Generally speaking, it is known that cyclical conceptions of the cosmos were relatively prevalent among the Presocratic philosophers, which points to a prominent, perhaps eternal role for time in the cosmos. The ideas of Heraclitus are particularly relevant here. However mysterious they may be, the dictum 'panta rhei' and several related pronouncements that are attributed to him are evidence of an unmistakable appreciation of the effect of time in the phenomenal world. It seems that the continual changes based, according to Heraclitus, on fire eventually arrive at a state of equilibrium for which the Logos is responsible. It is difficult to know exactly how he conceived those

relations, since all that we have of his work consists of isolated, often enigmatic fragments.

The situation is different when we come to the equally enigmatic South Italian philosopher Parmenides. He wrote a didactic poem of which a considerable part is still extant. In that work, the poet is instructed by a goddess whom he visits and who shows him three ways of thought. The first is the way of truth, based on the premise 'it is'. According to this way, there is a single being that is motionless, indivisible, without void, and without beginning or end. This being (the One) is not in time—neither in the past nor in the future—but only in a permanent Now, in perfect oneness and continuity. We already find here an idea that will crop up repeatedly in the course of the history of philosophy with thinkers like Leibniz and Kant: if being originated at a certain point in time, why did it happen then and not earlier (or later)? According to Parmenides' first way, creation and destruction are in the strictest sense unthinkable. According to a widely accepted interpretation that owes a great deal to the influence of G.E.L. Owen, that single, timeless being should be conceived as the object of thought, as that about which we think and speak. It follows from this that the denial of its being is impossible, since it is already thought. Being and being (the object of) thought now boil down to the same thing.²

The second way, based on the premise that being is not, is completely impassable for that very reason. Finally, there is the third way, which could be called the way of seeming. It is the way of the conventional but false opinions of mortals, in particular their ideas about how things originated, about time and change, about sensorial opposites such as warm and cold, light and dark, rarefied and dense. Some commentators have argued that these opinions still have a certain validity in Parmenides' eyes. However, it is more likely that they are put forward as senseless, though not as senseless as the second way, the direct denial of the way of truth.

For true thinking (thinking the truth) there is thus no plurality, no change and no time. Parmenides' clarity is a negative one. His follower Zeno of Elea drummed it into his readers and listeners by means of his famous paradoxes against plurality and motion. And if

² G.E.L. Owen, 'Eleatic Questions', in *Logic, Science and Dialectic*, ch. 1, esp. pp. 10–16.

time does not exist, the question of the origin and age of time disappears. This notion of the non-existence or unreality of time will also recur in the course of history. On that basis, the most one may wonder is how and why the *semblance* of time has been able to present itself—and perhaps too, thought within this illusion itself: when.³

Parmenides is also the main protagonist in the remarkable Platonic dialogue of that name. The dramatic setting is already curious. The narrator Cephalus tells what a certain Antiphon, who is primarily interested in horses at that moment, has heard from Pythodorus about an earlier discussion at which this same Pythodorus was present. The participants were Zeno of Elea, Socrates, Parmenides, and a young Athenian called Aristotle, though there is no connection with the later philosopher of that name. Antiphon's account leads into a word by word report of a highly complex discussion. Remarkable though this dramatic setting is, it is no more than a familiar Platonic technique taken to extremes. If it differs from conventional devices in literature (and film), it is only in degree. Much more remarkable, however, is the content of the dialogue.

Zeno begins with a speech against plurality. After Socrates (who is still a young man at the time of the discussion) has responded with an outline of his own doctrine of Forms, to which Parmenides in turn reacts, the latter is pressed to give a demonstration of the dialectic, the reasoning from hypotheses, that he proposes. Starting out from different hypotheses on the One, he draws a mass of consequences, with Aristotle as the willing discussion partner, that are bound to provoke astonishment. The number of dubious reasonings, incompatible outcomes and unresolved paradoxes is legion. It is no wonder that the point of the dialogue is much contested. In the words of R.E. Allen: 'The *Parmenides* has been read as everything from a joke to an exercise in the detection of fallacies to a revelation of the Unknown God'.⁴ There is not even agreement on the

³ For more on these and other Presocratic thinkers, see Kirk and Raven, *The Presocratic Philosophers*. On the paradoxes of Zeno in connection with time, cf. G.J. Whitrow, *The Natural Philosophy of Time*, section 4.4; it is confusing that the term 'stadium paradox' is used in different ways in these two and in other books. For lucid commentary see also Zwart, *Het mysterie tijd*, ch. 11; whether his solution is convincing is a different matter.

⁴ R.E. Allen, *Plato's Parmenides*, p. vii. The most recent study of this dialogue, with a new translation, is by R.G. Turnbull.

number of hypotheses that are dealt with by Parmenides, with opinions ranging from two to eight or nine. Allen has argued—convincingly in my opinion—that there are essentially two: the One is; and the One is not (whereby the One should be taken to be the Idea of unity).⁵ Besides, although the dialogue between Parmenides and Aristotle is explicitly presented as an instructive demonstration of dialectic, it must be more than that. If only because of its immediate connection with the doctrine of Forms, the theme must have been weighty enough in Plato's eyes for us to suppose that this dialogue is not just a demonstration or exercise.

It is thus worthwhile to pay some attention to a few passages connected with time.⁶ They are to be found especially in the arguments based on the hypothesis that the One is. There are two series of deductions. The first starts with the primary deduction: the One is one; this is then taken as the premise, and thus functions here as a sort of master conclusion.⁷ That the One is one, Plato's Parmenides is made to argue, implies that it is impossible for it to have all kinds of properties and their opposites. It cannot even be identical to itself, for in that case it would have an extra property in addition to being one, and would therefore be both one and not-one.⁸ For the same reason the One cannot partake of sameness or difference. This in turn entails that it cannot be as old, older or younger in comparison with something else or with itself. That it becomes older means that it becomes older than itself (as it is at the moment), but also that it becomes younger than itself (what something is at the moment becomes younger than what it later becomes). Of course, that is impossible for the One that is but one. The One is thus atemporal. It cannot be said of the One that it ever was or became or will be or will become. It therefore does not partake of being, and nothing

⁵ R.E. Allen, *op. cit.*, pp. 185 and 182. He works *de facto* with four hypotheses purely for the sake of clarity. On the relationship between the two parts of the dialogue, see also the Introduction by Mary Louise Gill in *Parmenides*, translated by Gill and Ryan, esp. pp. 3, 10 and 50–54.

⁶ The crucial passage (151e–155e) is even described by Hermann Gauss in the following words: 'Dies ist unbestreitbar eines der grössten Kapitel im Corpus Platonicum' [This is incontestably one of the major chapters in the Platonic corpus]. See his *Philosophischer Handkommentar zu den Dialogen Platons*, vol. III.1, p. 162; his commentary on pp. 162–170.

⁷ *Parmenides*, 137c–142a.

⁸ *Parmenides*, 139d, e.

truthful can therefore be said about it; it is not only timeless but also unknowable.

As an alternative, Parmenides offers a second series of deductions from the same basic hypothesis that the One exists, but this time starting with the primary deduction that the One partakes of being.⁹ The ensuing consequences are overwhelming, for this time the One proves to have an overabundance of properties that are often mutually contradictory. An important step is the deduction of the natural numbers. The fact that the One partakes of being means the duality of One and being, so that the number two arises, and subsequently all of the other numbers are derived from unity and duality. But everything that is forms in turn a unity. That is why the One is thus also a plurality; it is both a whole and its constituent parts, limited and unlimited at the same time. That is not all. The One finally proves to have mutually contradictory *temporal* properties as well, since if the One is and partakes of being, it must participate in the present, which comes and passes by. That means that the One becomes both older and younger than itself, as has already been shown. Every becoming shifts constantly to the transition between now and later, for in the present itself the situation has simply become what it now is. But since it is always *now*, the One does not only *become* older and younger than itself each time, but it actually *is* older and younger than itself. And since it is as old as itself every time too, it is *not* older or younger than itself.

What about the relation of the One to the rest in time? As the smallest part of the universe, it must have been the first to arrive; it is thus older than all the rest. But all the rest turned out to partake of the One, making it the final piece and therefore the youngest. Besides, it originates simultaneously with everything that originates, and is thus as old as the rest. The only part of this chain of deductions that does not lead to the impasse of paradox is the question of knowability. If the One participates in time, it is in relation to other things, and can therefore be known and named too.

Parmenides still has another trick up his sleeve. He remarks that the One cannot possess the mutually irreconcilable properties that it does possess, according to the preceding chain of reasoning, at the

⁹ *Parmenides*, 142b–155e.

same time. So its participation in time is characterised by constant changes of situation: from one to many and back, from similar to dissimilar and back, from rest to motion and back. What is more, the One also goes from being to non-being and back, since mutually contradictory properties cancel one another out, so that having them means not having them, something that is at the expense of its being. Although the One here partakes of being, it is constantly losing that being. And whenever these changes occur, Parmenides argues, the One is neither the previous nor the following: it is no longer the previous, nor yet the following. In time, however, it is constantly one or the other. So the changes do not take place in time. The One keeps falling out of time, as it were, since change can only take place at timeless moments.¹⁰

So reflections on time here immediately lead to problematic conclusions. The same is true of the origin of time. Nevertheless, there are a couple of theses from this second series which deserve special mention in this connection.¹¹

First, if something (the One or anything else) is, it participates in time and so time is too. On the other hand, if things are in time, the One must be, since everything that is partakes of the One by virtue of its property of being a single thing. In that case, then, time is apparently as old as the One, since it cannot be older or younger than the One.

This conclusion naturally does not apply to the first series of deductions. However, that stage of Parmenides' dialectical lesson was pre-eminently an impasse, since the One is taken to be unknowable, which is bound to mean that all concepts are lost from sight. In so far as concepts are knowable, time and the One originate at the same time.

This also means, at the most general level, that time is connected with the world of Forms. Not our notion of time, but time itself is

¹⁰ *Parmenides*, 155e–157b. This dilemma applies not only to the changes that the unity undergoes, but to all changes. This is one of the reasons why it has sometimes been thought that Aristotle's doctrine of change, time and the present is a reaction to what is written on these subjects in Plato's *Parmenides*. G.E.L. Owen in particular has vigorously defended this view. Cf. his essay '*Tithenai ta phainomena*', in *Logic, Science and Dialectic*, esp. pp. 247–251.

¹¹ The discussion of the first hypothesis continues a while. Afterwards the second hypothesis (the One is not) also leads to a contradictory tangle of consequences. In short, it is equally impossible for the One to be and not to be.

the object of debate and is taken to have a rational character. It is not confined to the phenomenal world, but is connected with the world of ideas. That seems to be the background to the persistent questions about the relation between time and the One. Discounting the first way that leads to a cul-de-sac, time and rationality are here thus closely interconnected, albeit in a complex manner.

The rational character of time is even more pronounced in the dialogue in which Plato tackles the question of time and its origin most explicitly: the *Timaeus*. It opens with an introduction on the perfect state and on a war between Atlantis and prehistoric Athens, where such a perfect state is supposed to have existed. Then Timaeus takes the floor. He explains how the world was designed and made by a divine craftsman or demiurge as an imitation of an unchanging, eternal, animate model. The model is an object of rational knowledge par excellence, and the demiurge is accordingly a paragon of rational orderliness.

As far as its material content is concerned, the world is fashioned from unordered, pre-existing material, but it is also animated. Its soul is produced in a complicated way as a compound of two substances: the changeable, divisible substance, and the unchanging, indivisible substance. The soul is between material and idea; it participates in both.

Visibility requires fire, tangibility requires earth. But fire and earth cannot in themselves enter into a harmonious fusion in the spatial world without air and water as connecting elements. The four elements are developed from the primeval matter, in which they exist in a latent, chaotic manner. The world as a whole takes on a spherical shape. The only motion attributed to it is rotation, for among all the kinds of motion rotation is the one closest to intellect and rationality. The soul penetrates this world from the centre and envelops it. The world lives in this way as a blessed god, self-contained and entirely self-sufficient.

The two great circles of the celestial sphere are also made from the soul: the celestial equator (the circle of the diurnal rotation) and the ecliptic circle (the circle of the sun's path through the zodiac). It is the orderly movements of the fixed stars, the sun, the moon and the planets along and from these two circles that cause time to arise, which is here beautifully defined as the moving image of eternity. To be sure, the model is eternal whereas the firmament has a past,

present and future, but the resemblance between changeless existence and a regular, uninterrupted, repeated movement is as great as can be.¹² Time is the most perfect reflection of unchanging eternity in the world of change. It is related to eternity as number is related to the unity.

At any rate, for the changeable world to reflect the ideal model as comprehensively as possible, the unchanging eternity of the model had to be represented. That representation is time, which consists of the motion of the heavenly bodies. *Timaeus* says so explicitly: time was born with the stars, and if they were ever to disappear, they would do so at the same moment. So when a little further on he calls the heavenly bodies the instruments of time or of the seasons,¹³ that does not mean that they are used by Time or that they measure something which already exists without them, but that they bring about time together with the corresponding units of measurement.

It is true that the interpretation of the passages on time is not uncontroversial, and that there is not even agreement on the interpretation of the key sentence on time as the moving image of unchangeable eternity. Rémi Brague pointed out that the conventional interpretation arose only centuries after Plato thanks to Plotinus and other Neoplatonists. He argued that even their predecessors like Philo have been misinterpreted in the light of the later standard interpretation, and considered it highly unlikely that time in the passages in question was intended as the image of eternity. According to Brague, it is more natural to interpret the controversial sentence as stating that not time but the heavenly firmament is the image of eternity, and to take the corresponding model (*aion*) to refer not to eternity as such, but to the soul, or more specifically to the mind (*nous*).¹⁴

¹² *Timaeus*, 37d and 38 b–c. Cf. a remark by John F. Callahan: ‘Change is something that necessarily belongs to becoming. But time is an aspect of that change that bridges the gap, as it were, between change and the immutability of the eternal nature’. *Four Views of Time in Ancient Philosophy*, p. 18; see also pp. 16–21.

¹³ *Timaeus*, 41e, 42d.

¹⁴ Rémi Brague, *Du Temps chez Platon et Aristote*, ch. 1, esp. pp. 13–24, 43–47, 55–63, 69–71. Cf. also *Timaeus*, translated by Donald J. Zeyl, pp. xlii–xliv, esp. n. 80. Brague argued that the interpretation of time as the image of eternity came about through a combination of linguistic factors and tendencies in the history of ideas. He also argued that the translation ‘image’ is not perfect; ‘imitation’ would be better. Finally, he defended the thesis that the heavenly bodies are the instruments of time because each planet has its own time by which its motions are dic-

These drastic proposals have not met with much support, but they are actually less drastic than they seem, for it has already been seen that time and the rotating firmament practically coincide in the *Timaeus*. It is only when time is taken abstractly that a large discrepancy emerges. Moreover, it then immediately becomes remarkable (as Brague also pointed out) that time can be an image of something. But if its essence is seen to be directly embodied or anchored in the firmament, the puzzling element disappears. At the same time, the difference between the two images, i.e. between the traditional image (time) and that proposed by Brague (the firmament) largely disappears as well.

Of course, this is all part of a pseudo-myth such as Plato likes to make up. *Timaeus*' account continues with the origin of living beings and the working of their senses. The role of the divine and rational demiurge recedes into the background as attention is concentrated on the properties of the four elemental substances and the consequences of those properties. Time and again *Timaeus* reminds his audience that he can only provide a probable account: his mythological story is no more than a plausible reconstruction. It is by no means a historical account. There is thus reason enough to treat the conclusions with caution.

Nevertheless, it can still be concluded that time in this myth has a certain starting point. That is already remarkable. It thereby differs from a conception like that of Pherecydes. The question then arises of whether one can go further. *Timaeus* himself raises the possibility that the actual sequence of the origin of the world may not be accurately reflected in his account.¹⁵ Perhaps the sequence should not be taken seriously at all; perhaps it is just a part of the mythological *mise-en-scène*. That is what some early Platonists and almost all of the Neoplatonists believed. Among modern commentators, A.E. Taylor in particular has defended the view that *Timaeus*' account of the genesis of time concerns only its logical conditions, not the

tated. In connection with the notion of *aion* as soul, cf. H.G. Gadamer in two articles on time in *Gesammelte Werke*, Vol. 4, esp. pp. 126–130 and 143–144. For a detailed study of the meanings of the word *aion* see Helena M. Keizer, *Life-Time-Entirety*; an analysis of the relevant passages in the *Timaeus*, in which Brague's view has also been taken into account, on pp. 62–81. The author concludes that *aion* here primarily means life as a unitary whole (pp. 77–79).

¹⁵ *Timaeus*, 34b–c.

chronology. Aristotle, on the other hand, interpreted Timaeus' account literally on the essential points. According to him, both time and the cosmos were attributed a beginning, and many, including Cicero, have followed him in this interpretation.¹⁶

It is a fact that the reference to the origin of time in the *Timaeus* is by no means incidental. The text makes repeated mention of the origin or birth of time. Timaeus also claims that the common divisions of time arose on that occasion. It is therefore difficult to escape the conclusion that time really is credited with an origin here—an origin that coincides with the creation of the heavenly bodies and their motions. It follows from this that, in so far as it is not identical to the rotating firmament, time is at any rate as old as that firmament.

But might the firmament not be eternal? That is difficult to imagine, because all that can be perceived through the senses must have had an origin.¹⁷ And there is more, for both Timaeus and Plato seem to have set out from the premise that the motions of the heavenly bodies, however complicated they may be, are so orderly and regular that they must be based on a concept. They have been designed and created, and have not always existed as a matter of course. This idea is implicit in the image of the construction of the world by a demiurge. A lot of Timaeus' account is a product of the mythological imagination, but the notion that time proceeds from the rational ordering of the world is not a part of that.

Space is a different matter. Timaeus calls it eternal and indestructible.¹⁸ The component parts of the original chaos already had a place. It was not even a fixed place, because there was change and motion.¹⁹ Of course, this immediately raises a major problem for the idea that time did not (yet) exist then. There is something and something happens before the commencement of time! Apparently there is a 'time' in a certain sense before the heavenly bodies come into existence. However, this is not time as Plato understood it, since for him there can be no time when only random changes and motions

¹⁶ See Richard Sorabji, *Time, Creation and the Continuum*, pp. 268–275, and John F. Phillips, 'Neoplatonic Exegeses of Plato's Cosmogony'.

¹⁷ *Timaeus*, 28d–e. For a brief survey of the main arguments see *Timaeus*, translated by D.J. Zeyl, pp. xx–xxv.

¹⁸ *Timaeus*, 52a–b, 52d.

¹⁹ *Timaeus*, 30a, 52e.

occur. Motion, it is true, is a necessary condition for the existence of time, but only rationally ordered movements are sufficient to bring about time. This interpretation was already defended by Plutarch. It could be said that for Plato time is essentially quantitative and, thanks to periodical movements, measurable. What ‘precedes’ that is merely a qualitative and non-measurable duration.

So time is based on reason. The question arises of whether time is thereby also dependent on the mind or the soul. These two notions must then be taken to refer to the souls that the demiurge set in the cosmos: the individual souls in individual bodies, as well as the soul of the cosmos itself.

Plato does not state this explicitly, but Richard Sorabji has shown that this question can be answered in the positive if the *Timaeus* is considered in combination with several other Platonic dialogues.²⁰ The *Timaeus* makes time dependent on the motion of the heavenly bodies, while in other texts motion is made dependent on the soul. This is the case in the *Phaedrus*, where the soul is called the source and principle of motion,²¹ and in Book X of *Laws*, where the soul is said to control everything that is in motion and to direct everything in heaven, on earth and in the sea through its own movements.²²

It is therefore difficult to resist the conclusion that time is dependent on the soul, all the more so since in *Laws* the temporal divisions belong to all that is said to be brought about by the soul.²³ Nevertheless, there is a problem since in these other dialogues it is also argued that the soul is divine and the origin of everything²⁴ and that it has no beginning or end,²⁵ while the *Timaeus* contains an account of its construction and thereby of its origin. Whereas the combination of three dialogues that differ from one another in terms of character and intention is already objectionable in itself, such a specific discrepancy only strengthens the objections. We can therefore only tentatively draw the conclusion about the dependence of time on the soul.

²⁰ Richard Sorabji, *op. cit.*, pp. 93–94.

²¹ *Phaedrus*, 245c–246a.

²² *Laws*, 896d–897b; see too 893b–899d.

²³ *Laws*, 899b. Moreover, the two celestial circles, the bearers of time, were already made from the soul in the *Timaeus*.

²⁴ *Laws*, 899b–c.

²⁵ *Phaedrus*, 245d.

CHAPTER THREE

ARISTOTLE: MEASURABLE DURATION AND INSTANT

The question of whether time can exist without mind was first explicitly raised by Aristotle in a passage at the end of his discussion of time in Book IV of the *Physics*. Earlier in that book he had dealt with place and void. He argues that time cannot exist without the soul, and in particular without its rational part.

Aristotle begins his discussion of time in Chapter 10 by tackling the question of whether time exists at all. Surely, the past no longer exists, the future does not yet exist, while the present (the ‘now’) is not even a part of time, but only divides times or periods of time. This view of the present can hardly have been a conventional one, for unlike his Greek contemporaries, Aristotle here understands the ‘now’ not as a certain, relatively short period, but as a strictly indivisible moment. These ‘nows’ successively form the present. This conception of the ‘now’ entails several other problems as well. For instance, Aristotle reasons, it is difficult to determine whether nows are always different from one another, and if so, how one now can succeed another since there is never an adjacent, consecutive moment. Neither is it possible for the same now to exist for ever.

However, Aristotle makes no immediate attempt to solve these dilemmas, but opposes them with his own view. He here seizes on the idea that time is identical to change. It is not that this idea is correct, but it takes us a stage further. Time serves to characterise change and in a certain respect to measure it; every happening has a temporal duration. So time does not coincide with any change in particular, not even with the motions of the heavenly bodies, as Plato’s *Timaeus* had suggested.

But it is true that time cannot exist without change (in which change of place, i.e. movement, plays a prominent role). We notice them simultaneously. Time (*chronos*) is an aspect of change, an aspect that is linked to the distinction between before and after. Time is, according to Aristotle’s famous definition, the number of change (or

movement) in respect of before and after.¹ In other words, time is the number that measures the amount of change or happening exclusively in relation to earlier and later. Put yet another way, time is the amount of change seen as a succession. In this way, every process of change that is taken into consideration has its 'time'.

It looks like a circular definition: time is the amount of change in relation to the succession in time, but what Aristotle is in fact defining here is the (quantitatively conceived) notion of temporal duration, in which the temporal succession is taken to be already known. He comes back to that succession later.

In the course of his argument the definition is further expanded. Now time is no longer called a number (*arithmos*) but a measure (*metron*); and it applies not only to change but also to rest.

The first expansion follows more or less naturally. Aristotle saw a strong resemblance between the single thing (a horse, for example) that we use as a measure to determine the number of things in a group, and the unit that we use to determine a non-discrete magnitude, because in both cases we count.² Still, he was fully aware that magnitudes such as length, size, motion, change and thus time too are continuous.³ Besides, for him and his Greek contemporaries number is always a natural number. Fractions could be written as ratios, but there was as yet no inkling of irrational numbers. Taken together, in the second instance this all casts the notion of measure in a very different light from that of number.⁴ At the least it gives rise to the possibility of indicating a magnitude with descriptions such as 'more than 7', 'roughly $7\frac{1}{2}$ ', or 'almost 8'.

The second expansion is legitimised with the argument that things can only be at rest if they are also capable of change. Rest presupposes the possibility of change. That is why things that are at rest (unlike things which are intrinsically unchangeable) are in time, and why rest has a determinate or at least determinable duration

¹ ἀριθμὸς κινήσεως κατὰ τὸ πρότερον καὶ ὕστερον, *Physics*, 219b1–2.

² *Physics*, 220b14–23.

³ *Physics*, 220a24–26. More particularly, Aristotle based the continuity of time on that of length and change, especially motion.

⁴ *Physics*, 220b24–31.

just as much as the change that could have taken place. Thus Aristotle arrives at the final definition of time as the measure of change and rest in relation to earlier and later.⁵

Both change and rest are in time. A unit of measurement is required to determine their duration, and Aristotle finds that, of course, in the cyclical motion of the stars. Uniform circular movements, he claims, are pre-eminently suited to providing a measure of time because their number is the most intelligible number;⁶ besides, they are available in the sky. Two processes that begin and end simultaneously have not only the same duration; that duration can now be measured too. Measuring time thus becomes a question of arithmetic, of course including rounding off, approximating and dividing: the counting of recurring periods such as years, months, days, and whatever else is possible on that basis.

In other passages, however, Aristotle refers to the role of the now (*to nun*) for determining temporal duration, and in that connection he also has something to say about succession in time. He claims that simultaneous times are identical because there is always only one now (two nows cannot exist simultaneously), while the now also determines time in relation to before and after.⁷ In so far as the now is taken to divide the past from the future and thereby to determine them too, this is hardly surprising, but Aristotle goes further: after remarking that there would be no such thing as the now without time and no such thing as time without the now, he concludes that the now is (like) a unit of number.⁸

Is time as the measure of change and rest in respect of before and after thus essentially the number of successive nows? That would be a strange outcome. Aristotle recognises that the now is an aspect of time and in that way is in time and belongs to time;⁹ he even characterises the order of events within the past and the future by means of their distance from the now.¹⁰ All the same, he still insists¹¹ that the now is not a *part* of time because time is not composed of

⁵ *Physics*, 221b7–22.

⁶ *Physics*, 223b18–20.

⁷ *Physics*, 219b9–12.

⁸ *Physics*, 219b33–220a4; cf. 220a21 on the now as number.

⁹ *Physics*, 221a13–16.

¹⁰ *Physics*, 222b30–223a8; likewise in *Metaphysics*, Book Δ, 1018b15–19.

¹¹ Later again in Book VI, 231a21–b18.

nows, just as a line, in his view, is composed not of points but of line segments.¹² So most commentators do not go so far as to connect duration with the number of nows, although they have difficulty in coming up with a different and better interpretation of the passages on the now as a numerical unit and a number.

John F. Callahan does draw that conclusion, and at the same time he introduces the role of the mind: 'Without forgetting that time and motion are continuous we may number time by means of the indivisible nows that the mind perceives. [. . .] The mind distinguishes indivisible nows in the continuous flow of time and allows each to stand for a number according to the order of prior and posterior in which they occur'.¹³ A few pages later he states: '[. . .] we number motion by means of the now, taking the indivisible, discrete nows as they present themselves to the mind, and giving them a number as they occur in the order of prior and posterior'.¹⁴

This certainly is the maximal interpretation of the passages under review. Callahan has found few supporters, and his interpretation has been regarded by some as evidently incorrect. One of these critics is David Bostock, but Bostock's own interpretation is no improvement.¹⁵ His claim that Aristotle's remarks on the now as number imply that the now, like a number, is a universal (after all, it is applicable to all simultaneous events) is far-fetched.¹⁶ None of the other solutions that have been advanced over the centuries resolves the issue. There have been attempts to declare a part of the relevant passages corrupt, as the great W.D. Ross did,¹⁷ for instance, but there are apparently insufficient arguments to support this view.

If these passages are left out of account for other reasons, equally surprising conclusions may be drawn. For instance, in a particularly interesting article, Sarah Waterlow argued that if the Aristotelian now is thought through consistently, it falls outside the temporal

¹² Aristotle's statement that the word 'now' is also used to refer to brief and close periods (*Physics*, 222a21–23) is of a different kind and does not bear on the present discussion.

¹³ John F. Callahan, *Four Views of Time*, p. 57.

¹⁴ *Ibid.*, p. 62. Cf. Philip Turetzky, *Time*, p. 24.

¹⁵ David Bostock, 'Aristotle's account of time'.

¹⁶ *Ibid.*, pp. 162–163. Bostock repeated this claim in his excellent introduction to the translation of the *Physics* by Robin Waterfield, p. xlvi.

¹⁷ On 220a21–22.

order. It does serve as the point of reference for determining prior and posterior, but is itself for that very reason neither prior nor posterior to anything at all. Past moments are prior or posterior to one another (depending on their distance from the present), and the same is true of future moments (*idem*), but the present does not belong to the series. The present cannot even provide a basis for the conviction that the future comes after the past, although it is true that every event which is a future event at the moment will at some time come after every event which is a past event at the moment, namely when it has itself also become a past event.¹⁸ She sets out from the premise that Aristotle is preoccupied with time as measurable duration; he explains time, she writes, *sub specie mensurabilitatis*.¹⁹ The now is certainly credited with a central function in this enterprise, but, she argues, at the expense of its natural place in time.²⁰ However, it is almost inconceivable that Aristotle would have thought of the present as neither posterior to the past nor prior to the future, even though Sarah Waterlow makes a heroic effort to argue that case.²¹ Was Aristotle prepared to break so drastically with common sense? Even apart from this general objection, there is the problem that has already been mentioned: to arrive at her conclusion, she has to skip over something, namely the remarks that establish a direct connection between the now and counting (the measurement of time). Remarkably enough, she does refer a few times to passages containing remarks of this kind,²² but she ignores the parallel between the now and number. And even without following Bostock's interpretation, that parallel seems to imply at least a succession of all moments.

However unclear and contested the interpretation of Aristotle's intriguing remarks may be, there can be no doubt that the now occupies a key place in his doctrine of time. Moreover, he returns to it in detail in the first chapters of Book VI in connection with continuity. Although it has already been shown that the now does not partake of time, it is an essential 'constituent'. The now func-

¹⁸ Sarah Waterlow, 'Aristotle's Now', p. 126.

¹⁹ *Ibid.*, p. 111.

²⁰ *Ibid.*, pp. 122–128, esp. p. 124.

²¹ *Ibid.*, pp. 125–128.

²² *Ibid.*, pp. 107 and 120, to 219b22–27 and to 220a1–9.

tions as the hinge, as it were, on which time depends and along which it moves. It limits and connects past and future, making them possible and effecting them, thereby determining before-and-after and even bringing them about. Of course, there can be no now without past and future, but in the first place there can be no past or future without a now.

In a key passage, the now is itself referred to as the before-and-after.²³ After all, it marks the introduction of the future and the end of the past; it might be said (*pace* Sarah Waterlow) that it is the prior of the posterior and the posterior of the prior. That passage is in fact the prelude to the first formulation of Aristotle's definition of time. The question then arises of whether its content also applies to this definition, so that time would be described there as the quantity of change in relation to the now, or to nows. In that case, it would naturally lend strong support to Callahan's interpretation, but it is doubtful, since in the meantime before-and-after has primarily come to signify succession again.

Besides this ambiguity of before-and-after (succession or now?), another ambiguity can be detected, which cropped up several times in the preceding discussion. 'Now' refers here not only to 'the moment of the present' but often to 'the moment in general'. The latter is usually the preferred interpretation of passages where there is mention of more than one now. So the now divides not so much the past and the future as any period of time whatsoever. It is the now in this general sense that Aristotle compares to a point on a line. In a penetrating discussion, G.E.L. Owen has shown that these two meanings are interconnected in Aristotle. Not only is the present an indivisible moment, but each moment is also a present, at least potentially or in the imagination. The nows that succeed one another are the phenomenal forms of the one, moving Now.²⁴

Owen also argues that the comparison of time with space (line,

²³ *Physics*, 219a10–30, esp. a22ff.; cf. 219b25 on the now as the countable before-and-after.

²⁴ G.E.L. Owen, 'Aristotle on Time', in *Logic, Science and Dialectic*, pp. 295–314, esp. 305–309. Sarah Waterlow has an ingenious and far-reaching explanation for this ambiguity of the word 'now'. She suggests that the reason lies in the essential role of coincidence or simultaneity in the bringing about of measurable duration. Since the present plays a privileged role in the determination of simultaneity, her argument runs, Aristotle proceeded to use the word 'now', and not, for example, the word 'when', to refer to a moment; see her article 'Aristotle's Now', pp. 110–113.

trajectory, movement, point) is not purely heuristic, but has an ontological force too. It is more than a useful comparison, for in Aristotle time and our knowledge of time are partly anchored in space and in our knowledge of space. The doubt about the reality of time with which Aristotle began is thereby, according to Owen, removed once and for all.

To return to Callahan, all things considered he attributes to Aristotle the view that the mind divides time into a series of discrete moments, while in reality time is continuous and not a single duration of time is composed of such moments. The mind is taken to perceive these nows as discrete and finite, while they are not so in reality. So perhaps the germ of the idea of what William James and others were later to call ‘the specious present’ is already latent here.

As we have seen, it does not all add up and it remains puzzling what Aristotle actually had in mind. Callahan solves a few of those puzzles, but the price is too high. That remains the case, since it is true not only of the now, but also directly of the problem of the relation between time and mind.

Without a doubt Aristotle sees a certain connection between time and the soul. Although he concentrates on explaining physical, not psychological time, he does mention the soul a few times at the start of his argument. He states there that if we do not receive an impression of change or fail to experience the difference between one now and another, time seems to stand still.²⁵ On the other hand, if we receive no impression of a change from the outside world but our soul experiences a change, we immediately suppose that time has past.²⁶ However, these remarks are only intended to demonstrate the connection between time and change. Aristotle here shows that time is an aspect of change and presupposes change. There is no time without change, not only ontologically but also conceptually, for if we are not aware of (at least the possibility of) any change, we suppose that no time has passed. Repeatedly Aristotle gives the impression that, vice versa, there can be no change without time since change implies time, but that would be doubtful once time is taken to depend not only on change but also on the soul—precisely what Aristotle argues in the final chapter of Book IV.

²⁵ *Physics*, 218b21–23; 218b27–219a1.

²⁶ *Physics*, 219a4–7.

His argument runs as follows. If the existence of everything to do the counting were ruled out, that would rule out the possibility of counting, and thus of the existence of anything countable. In that case, there are no numbers either. And since only the soul (or its rational part) is capable of counting, it is impossible for time to exist if there is no soul. The most that can exist is what ‘constitutes’ time, its material, as it were: change with its before-and-after. But time is only the number of that.²⁷ Of course, this argument remains essentially the same if ‘counting’ is replaced by ‘measuring’.

Taken literally, Aristotle is saying that if it is impossible for something to exist that can count, it is also impossible for something to exist that can be counted, so that (assuming that the soul is the only entity capable of counting), time cannot exist without the soul. However, the first ‘impossible’ is out of place and is too strong for what Aristotle wants to argue. Perhaps he intended a strong or definitive negation: ‘if it is certainly not the case that . . .’. Even so, Aristotle is handling modalities here in a strange way, for the second ‘impossible’ is dubious too, and even replacing it by a negation will not help. Aristotle apparently means to say that no counting can be done if there is nothing that can count, and there is nothing wrong with that, but that does not yet mean that nothing countable exists. After all, it might be supposed that something in reality is countable if there is something to be counted, even if there is no entity at hand to carry out that counting; in other words, already in the case that counting could be done *if* there were something to carry it out at hand. Seen in this light, time exists once change is, can or could be measured in relation to before and after. That is not enough for Aristotle, at least in this passage; or rather, he assumes that that measurement can only be carried out once there is an entity at hand that can do it. A measure thus presupposes the existence of two things: something that can be measured, and something to do the measuring.²⁸

Nothing in Aristotle’s preceding discussion has prepared the reader

²⁷ *Physics*, 223a21–28.

²⁸ This passage on time and mind has been repeatedly commented on over the centuries by philosophers such as Plotinus (*Enneads* III.7.9) and Thomas Aquinas (*Commentary on the Physics*, IV.23.627–629). I return to this later. See also Jeck, *Aristoteles contra Augustinum*, pp. 6–13.

for this conclusion, which is all the more drastic in that it does not just apply to time, but can immediately be generalised to everything that is connected with counting or measuring. It is only by virtue of the mind that numbers exist and that any part of the universe acquires quantity, size, speed, duration or any other quantitative property. Aristotle might be said to be adhering to a form of constructivism here—not social constructivism this time, but a mental constructivism: the existence of any quantitative magnitude requires its construction, and that calls for mind. It is perhaps no coincidence that Aristotle raises the question of the dependence of quantitative magnitudes on the mind specifically when he is dealing with time. This could be connected with the sceptical remarks on the existence of time with which he began. He would also thereby anticipate all those later thinkers for whom the dependence of time on mind is a much more urgent question than that of the dependence on mind of space, temperature or weight, for example.

It would be much easier to understand Aristotle's conclusion if Callahan's view of the Aristotelian notion of time were right. If duration were based on counting discrete nows that have no existence but are experienced by the mind and are thus created by the mind, then the mind would have much more importance for the measurability of duration than just as a measuring or counting entity. It would be responsible for what is to be measured and counted. Moreover, the dependence of time on mind would then be very different from the dependence on mind of temperature, weight, and perhaps even space. But once again this solution seems to be ruled out, for there is nothing of the kind in the passage under consideration. On the contrary, when the mind is ruled out as the counting or measuring instance, it is still considered possible that everything else that is necessary for time (the 'constituents' of time) is to hand. That also applies to before and after, and thus to succession. They fall outside the preserve that is dependent on the soul.

But does this also apply to the now, the single, unique moment of the present? The thesis can be defended that the present, strictly speaking, cannot exist without consciousness. The argument is then that the present only exists when a consciousness has a sense of now, feels, thinks or says 'now', whereby the moment of the present is detached from the succession of all moments. This is one of the two primary reactions to the problem of time and mind, as discussed in

the first chapter.²⁹ The argument is not compelling and it has a direct rival, but could Aristotle not have made his conclusion more convincing by means of an argument of this kind? In that case he would have been justified to some extent in pointing out the dependence of the now on the soul or mind: not the discrete now envisaged by Callahan, but the now in the strict sense as he himself defined it and which occupies such a key position in his philosophy of time. The same would then apply in the second instance to the past and the future, and even to 'now' in the sense of moment, if only because it continues to have the connotation of 'the present', as Owen has shown. In this way succession in its generality could still be made dependent on the mind. There would be hardly anything left in time that was not dependent on the mind. However, this conceivable alternative was in fact ruled out. Aristotle could not countenance it, especially because of his view of change. He was too strongly convinced of the independent reality of change to be able to doubt the independent reality of the moving now. That now forms the basis of change, after all, of the transformation of something that does not yet exist into something that does, and of something that exists into something that belongs to the past. Time is guaranteed anyway as an aspect of the change that takes place in reality. Aristotle took the doubts about time seriously, but he did not accept them.

Directly connected with the question of time as the measure of change is that of the age of time. This is, after all, a question of temporal duration. And if time cannot be older than the soul, then the soul is connected with it too. Is time finite or infinite, with or without a beginning and an end? Aristotle had already discussed some aspects of this issue in Chapters 4 to 8 of Book III of the *Physics* in the context of the question of the limited or unlimited nature of space. He came back to it in Book VIII.

In Book III he had argued that space must be bounded. Although any spatial distance, plane or volume is infinitely divisible, none is infinitely large. An infinitely large body in itself cannot exist, and besides there is no room for it because the universe is finite. Time, on the other hand, is not only infinitely divisible but also infinitely long. There is neither a shortest nor a longest period. This infinite

²⁹ See pp. 9–10.

duration even applies in both directions: time has neither beginning nor end.

Aristotle had two different reasons for adopting this position. The first is that change has neither beginning nor end. The main argument for that is that the prime mover, the ultimate unmoved cause of all events, is timeless and has neither started to cause movement at some point in time nor will be exhausted at some other moment. And everlasting change requires infinite time. Aristotle here tacitly assumes that the soul has always existed and will always continue to exist; at any rate, he leaves out of account the possible complication of its non-existence.

The second reason for the double boundlessness of time is that a first and a last now are unthinkable, since a now implies something that precedes it and something that follows it (or, formulated à la Sarah Waterlow: something that has already been and something that still has to come). After all, it both divides and connects the two of them.

This boundlessness of time seems to bring Aristotle into conflict with his well-known point of view that the infinite only exists potentially. That time will continue indefinitely can be accommodated with potential infinity, but that it has had no beginning inevitably seems to entail complete, actual infinity, since at every moment an infinitude of temporal units (days, years) has passed. Aristotle does not go into this problem.³⁰

We have already seen that there are more loose ends in the *Physics*, apart from other ambiguities or even contradictions. Like so many of Aristotle's surviving texts, this work on the fundamental principles of the study of nature is evidently unfinished. In a good number of places it has the character of notes that have not been thoroughly elaborated, possibly to be used for teaching purposes. It is practically certain that it was finally edited by others, and it may be a collage of texts with different backgrounds.

Even in this incomplete and apparently somewhat mutilated form, it is a dazzling display. Aristotle's intellectual urge to explore, his demand for clarity, his analytical ability and his grasp of the sub-

³⁰ Cf. Richard Sorabji, *Time, Creation and the Continuum*, p. 212, and the note by David Bostock on *Physics* 207b15 in Aristotle, *Physics*, p. 252; see too his comments *ibid.*, pp. xxxiv–xxxvi.

ject emerge clearly from the pages of the *Physics*. That is why it is hardly surprising that this work fascinated many scholars down to the Renaissance. It has been one of the most influential and widely commented works in the history of Western philosophy.

Various sections are relatively unconnected with the main themes of Aristotle's metaphysics. They deal with the fundamental principles of the natural sciences in a way that is not only interesting from a historical point of view, but is also in itself worthy of attention, and at times surprisingly modern. They include Book IV, and in particular the discussion of time. A striking facet of that modernity is the resemblance of Aristotle's philosophy of time to that which Leibniz was to develop two millennia later. Both philosophers assume a close and intrinsic connection between time and change. They both rule out the possibility of empty time, because time does not flow by itself. Of course, Leibniz went further and tried to explain temporal succession, for example, in terms of cause and ground. He also came up with a different answer to the question of the age of time. That answer was not marked by any higher level of scientific finesse, however, but was based on the biblical account of the creation. Aristotle had replied to the question of the age of time as Newton was to do, though adducing very different motivations. For Aristotle, as for Leibniz, time was as old as the world. For Aristotle, however, the world being infinite, time was infinite too.

CHAPTER FOUR

ATOMISTS, HOLISTS, MORALISTS: THE EPICUREANS AND THE STOICS

The emphasis that Aristotle laid on temporal duration as a measurable entity may look strange. After all, it seems that in his day time could hardly be measured at all. The existing instruments for measuring time were very inaccurate compared with today's wrist-watches and domestic clocks, let alone precision chronometers and cesium clocks. The situation did not change for a long time, as the first mechanical clocks were not made until around 1300.

Aristotle was familiar with sundials, the oldest extant instrument for measuring time. They already existed in ancient Egypt, and subsequently spread far and wide. An indication of this is provided by the complaint of a character in a comedy by Plautus (ca. 200 BC) that his daily routine was determined by a sundial. In the past he ate when he was hungry, now he was only allowed to eat at the proper time.¹ Sundials must have been in use throughout the Mediterranean long before their presence began to bother anybody. They had the advantage that they were easy to use, but their usefulness was naturally dependent on circumstances, and in the most favourable case, namely when the sun shone, they did not yield much more information than one could obtain anyway by simply taking note of the position of the sun or the length of the shadows. That cannot have been so difficult, even for early city-dwellers, and much less so for country-folk (but it should be borne in mind that sundials could also be used as annual calendars).

The division of the day into hours, even into 24 hours per day, also goes back a long way. It was done in the form of 12 daytime hours and 12 night-time hours, the division between them mostly being marked by sunrise and sunset. This division was probably invented by the Egyptians and adopted by the Babylonians. The

¹ It is in a fragment from the otherwise lost comedy *Boeotia* (The Girl from Boeotia). See too Boorstin, *The Discoverers*, p. 28.

Greeks used it at any rate from the time of Alexander the Great, a contemporary of Aristotle, and the Romans never departed from it. The system was maintained until late in the Middle Ages. All the same, it had notable weaknesses. The length of a daytime hour differed from that of a night-time hour, and both varied in the course of the year. Early astronomers therefore called for the hours to be regulated uniformly. However, it was not until the dissemination of the mechanical clock in Europe in the fourteenth century that the day was divided into 24 hours of equal duration. These hours were soon sounded mechanically. Incidentally, the public announcement of the time was already practised in antiquity: around 200 AD Tertullian mentions that the third, sixth and ninth hours were announced by trumpeters.²

Besides sundials, there were clepsydrae in antiquity too. They were pre-eminently suitable as measures of duration, and as such they played an important role in Rome in restricting the duration of speeches in the courts, which were not allowed to exceed a certain limit. From a passage in Galen (second century AD), however, we know that clepsydrae were also used to determine the time of day (or night) and that they could also be used to calibrate the hours.³

Clepsydrae were of no use during a frost, and the more complex they were, the more attention they required. This was especially true of the *de luxe* versions that were made over the centuries. For instance, in 807 Haroun al-Raschid gave Charlemagne a splendid clepsydra that could strike the hours and from which twelve horsemen appeared at noon,⁴ but it took a large staff to keep this clock going. Nevertheless, good clepsydrae could be very accurate. In fact, it was some time before mechanical clocks became more accurate than the best clepsydrae of that period.

Candle clocks and hourglasses worked on the same principle as the clepsydra, and also required regular attention. The hourglass was of course an extremely useful and easy-to-use instrument, but it was not found in antiquity.

All in all, then, the result for the age of Aristotle is meagre. Still,

² Bilfinger, *Die antiken Stundenangaben*, pp. 54–57. Cf. Landes, *Revolution in Time*, p. 60. An Arab traveller attests the existence of a similar public announcement of the time in China in the ninth century; see Landes, p. 26.

³ Bilfinger, *op. cit.*, pp. 79–82. Clepsydrae were in use in China too.

⁴ Cipolla, *Clocks and Culture*, p. 25.

this was primarily true of the measurement of smaller periods of time—the smallest divisions of the day—and that sort of precision was not really called for. For longer periods nature had provided a wonderful clock in the firmament for the measurement of days, months and years. We should not allow ourselves to be unduly influenced by the modern devices for measuring time that have become so indispensable but were not missed in the past. Without them it was still possible to measure, determine or estimate lengths of time. Time was one of those things that could already be measured at a very early date, unlike, for instance, temperature.

Upon closer investigation, there is therefore no need for Aristotle's emphasis on the measurability of temporal duration to come as a surprise. For Plato too time was a measurable entity from the start because it coincided with the cosmic timepiece of the revolving firmament.

Something of this focus on the measurability of time can also be found among the representatives of other ancient philosophical schools, although the situation is often unclear because the texts that have come down to us are so incomplete and fragmentary.

For a start, there were the classical atomists: Leucippus, Democritus, and somewhat later Epicurus and his followers. Their view of the world diverged sharply from that of Aristotle, whose work includes polemics with the views of Leucippus and Democritus in various places and who would have not have been impressed by Epicurus either. The existence of the void, a central premise for the atomists, was contested by Aristotle in Book IV of the *Physics* just before his discussion of time, and he equally rejected the existence of indivisible particles. Nevertheless, his views on time shared some points in common with the atomists. They too argued that change had no beginning, though for them it was determined by the collisions of the atoms in motion in the void. Epicurus states this explicitly in his *Letter to Herodotus* (known to us through Diogenes Laertius).⁵ Later in that letter he refers to time as a property of what takes place. He emphasises its specific character, but it is not an essential property, because time is not necessarily connected with the atoms or the void. It is a non-permanent, fortuitous circumstance (a *symptomata*). Epicurus

⁵ Diogenes Laertius, *Lives of Eminent Philosophers*, X.43–44.

mentions both long and short lengths of time, and thus he too appears to attach considerable importance to the quantitative aspect from the start. Perhaps it is even significant that the first example he gives of a situation in which time appears is that of day and night, in other words, durations of time from which it is simple to determine the duration of other periods.⁶

Epicurus also points out that time applies generally and to all that takes place. Time does not lack materiality or reality, even though it does not exist by itself. Epicurus and Aristotle thus concur in the view that there is no time without change or rest. Something has to happen if there is to be time; although Epicurus considered the empty space to be necessary, he found empty time inconceivable.

The reverse also seems to be the case: no happening without time. Consequently, time must be as old as change, and since change will never end, time cannot have an end either. However, a complication arises at this point. Epicurus lays great emphasis on the fact that we must not separate time from what we mean by the word 'time', and his further remarks suggest that time is *our* time. Is time for Epicurus in the last resort dependent on the soul, the mind or the consciousness? This suspicion is strengthened by the reference to time as a manifestation or impression (*phantasia*), or as something that accompanied a manifestation, in an extant fragment from another Epicurean work, *On nature*. Sextus Empiricus attributed a similar view to the followers of Epicurus.⁷ Given the notions of the Epicureans about the soul and perception, this need not at all mean that time is lacking in materiality and reality, but it does indicate that time could not exist without the soul. Thus, although proceeding from very different premises from those of Aristotle, Epicurus and his followers would have arrived at the same conclusion.

However, the matter is controversial, and as in the case of Aristotle, it is unclear exactly what importance should be attached to this conclusion. It is even conceivable that Epicurus basically entertained two notions of time: besides our time, the time that appears to us, that we measure and that is a fortuitous property of what takes place, there could be a general and universal time, the unmeasured time

⁶ Ibid., X.72–73.

⁷ Sorabji, *Time, Creation and the Continuum*, p. 95; see too the following citation from Lucretius, *De rerum natura*, I, 460.

in which the atoms fall and move from eternity to eternity. This universal time would be not fortuitous but necessary, for without it there could be no fall or motion, and it would not be dependent on the soul in any event. But Epicurus is not explicit about this time; at most he implies that it must exist. What he does say concerns time as we know and determine it in our world (one world amid an unlimited plurality of other worlds). Our time could be a specification of the universal time; numerous other specifications could exist as well.

However that may be, it is certain that time does not have the same status as the two fundamental substances: the matter consisting of atoms, and the void. Lucretius says it already in the first book of his *De rerum natura*, the great didactic poem that he wrote around 50 BC to express the Epicurean philosophy. All that takes place, he states, belongs to these two substances, either as an essential and necessary property, or as something fortuitous, an eventuality or an accident (*eventum*). He cites slavery, poverty, wealth, war and concord as examples of accidents; but the first elaborated example is time:

Time also exists not of itself, but from things themselves is derived the sense of what has been done in the past, then what thing is present with us, further what is to follow after. Nor may we admit that anyone has a sense of time by itself separated from the movement of things and their quiet calm.⁸

Moreover, the events themselves that are mentioned here (what takes place) are no more than accidents, as Lucretius explicitly states a few lines later when the second elaborated example of an eventuality, the course of historical events with the Trojan war as *pièce de résistance*, leads to the conclusion that they are all accidents.⁹

⁸ Lucretius, *De rerum natura*, I, 459–463, cited from the prose translation by W.H.D. Rouse. Strictly speaking, the last two lines (*Nec per se quemquam tempus sentire fatendumst/semotum ab rerum motu placidaque quiete*) only state that time cannot be known independently of movement and calm, not that it cannot exist independently of them; cf. the prose translation by Cyril Bailey: ‘And it must be avowed that no man feels time by itself apart from the motion or quiet rest of things’. In view of the preceding lines, however, that cannot be the intention here, where time is the most important example of an accident that belongs to the fundamental substances and has no independent reality.

⁹ *Ibid.*, 478–482.

Thus time is a fortuitous property of all these fortuities. This can be understood by considering that the events could have proceeded at a faster or a slower pace for, like Aristotle, Epicurus and Lucretius are primarily talking about duration, and in particular about a determinate or at least determinable duration. It could have been shorter or longer. Once again the suspicion arises that behind this time as a determinable duration lies another time, one that is not determinable but necessary. For is the circumstance that the events have a duration—in other words, take place in time—inessential and accidental? They could not have been timeless, could they? ‘A property is that which without destructive dissolution can never be separated and disjoined’, Lucretius had written.¹⁰ In other words, a necessary property of something is inextricably bound up with it, and that seems to apply to the temporal dimension of events, including those of the Trojan war, as well. These events are dissolved if time is detached from them.

As for Aristotle time is in a certain respect subordinate to space, so for the atomists it is subordinate to matter and the void. In their case the dependence seems to be stronger, and thus the position of time weaker. Their notion of time, after all, is the accident of an accident. They are even further away from the views of Aristotle with the notion sometimes ascribed to them that not only matter but also time is atomised and consists of tiny, indivisible elements. It is debatable whether they really did entertain such a view. It sounds plausible given their atomism, and at any rate they nowhere subscribe to the unlimited divisibility of time, but the interpretation of the relevant passages in Epicurus’ *Letter to Herodotus*, in Lucretius and a few other sources is dubious and controversial.¹¹

The Stoics took a different view. It is virtually certain that they accepted the unlimited divisibility of time, and their views on the matter are certainly closer to Aristotle’s. Their view of the physical world was thoroughly orientated towards continuity and connected with continuity.¹² This immediately implied a conception of the

¹⁰ *Ibid.*, 451–452.

¹¹ Diogenes Laertius, *op. cit.*, X.47 and 62, where Epicurus talks about times that we distinguish only by our reason, and Lucretius, *De rerum natura*, IV, 794–798. Cf. Sorabji, *op. cit.*, pp. 375–377, and pp. 17–21 on atoms of time in Diodorus Cronus; cf. also Sambursky, *Physics of the Stoics*, pp. 103–104. Turetzky accepts the atomism of time for the Epicureans: *Time*, pp. 34–37.

¹² Sambursky, *op. cit.*, ch. 1 and *passim*; for a succinct and clear account of the

present as an instant. It is true that some pronouncements by (and on) the Stoics indicate a different conception of the present, but they went on to argue that in this sense the present is part past and part future. Aristotle had also mentioned such a conception of the present, though only as an aspect of conventional usage. As we shall see, this alternative conception of the present played a more important role for the Stoics.

It would appear that, unlike the treatment of time by Epicurus and his followers, that of the Stoics was a pretty direct reaction to the problems and solutions that Aristotle had pointed out and defended. This might already be seen from their definition of time itself, which comes close to the definition offered by Aristotle, but the difference between them is significant. For the Stoa time is an aspect of motion or change, though not as number or measure but as distance, dimension, or interval (*diastēma*). This at least is the definition attributed both to Zeno of Citium, the founder of the Stoa, and to Posidonius, who lived two centuries later and belonged to the Middle Stoa. Every movement has its own interval, from infinitely small to infinitely large. Chrysippus, the third and best-known leader of the ancient Stoa, is supposed to have put it slightly differently. According to one of the extant passages from his extensive oeuvre, which is almost entirely lost, time is called the interval that corresponds to the motion of the *world* (*kosmos*).¹³

Perhaps this variant was inspired by the *Timaeus*, but that is not necessarily the case. There are other explanations available. At any rate, the appeal to the cosmos will have been connected with the holistic world-view of the Stoa itself. In opposition to the atomistic world-view of Democritus and Epicurus, the Stoa emphasised not only the continuity of things, but (doubtless in connection with that) also the interdependence of everything that takes place in the cosmos.¹⁴ Finally, Chrysippus' definition refers more especially to the period of the cosmic cycle. Another Stoic, Apollodorus of Seleucia,

Stoic notion of time, see ch. IV, section 3, pp. 98–108. Cf. also J. Brunschwig, 'Stoic Metaphysics', pp. 214–216.

¹³ For the translation of and commentary on the extant summary of Chrysippus' ideas see Victor Goldschmidt, *Le Système stoïcien et l'idée de temps*, pp. 30–45, and Long and Sedley, *The Hellenistic Philosophers*, Vol. I, pp. 304–308.

¹⁴ On this connection between continuity and monism or holism, see Goldschmidt, *op. cit.*, pp. 44–45.

is explicit about it.¹⁵ What was behind this? Victor Goldschmidt has argued that Chrysippus needed the cosmic period to confer on time a unity, a rhythmic dynamic and an anchoring in reality.¹⁶ According to J.M. Rist, on the other hand, the main motive was the need for a few fixed points in the continuous flow of all coming and disappearing events. The beginning and end of a cosmic period were supposed to be outside time themselves, but served to make the interval of time between them determinable.¹⁷ However one explains this appeal to the cosmic period, it rules out the implication—as the Epicureans may have held—of a second, indeterminable, universal time. The unity of time is here guaranteed in advance.

All in all, it is quite possible that the Stoics tried to improve Aristotle's definition of time. Their definition looks like a correction of that earlier definition. The grounds for that correction are debatable. Strato, the third leader of the Peripatetic school, had also objected to the role of number in Aristotle's first definition because time is continuous while number is discrete.¹⁸ The Stoics will have agreed wholeheartedly. That objection no longer applies to the concept of measure in Aristotle's revised definition. Did the Stoics, unlike so many of their predecessors and contemporaries, prefer a more qualitative conception of time to a quantitative one, and is that why they adopted a different term?¹⁹ However, it is not self-evident that the concept of distance or interval was intended in a predominantly qualitative way, especially as at the same time it was stated that time is a measure of speed or slowness. The question then arises of why the essential reference to prior-and-posterior is lacking in the Stoic definition of time. How could this definition guarantee that the 'interval' was understood as they intended without such a reference? Was this reference perhaps tacitly implied in the acceptance of a modified version of Aristotle's definition, or was it simply included in the temporal use of *diastēma*? Or did it mark a deliberate departure from Aristotle to place a strong emphasis on 'movement' in order to make

¹⁵ See Sambursky, *op. cit.*, p. 106.

¹⁶ Goldschmidt, *op. cit.*, pp. 34–35 and 41–42.

¹⁷ J.M. Rist, *Stoic Philosophy*, ch. 15: 'Three Stoic Views of Time', pp. 276–282.

¹⁸ At least according to Simplicius; see Sambursky, *op. cit.*, pp. 100–101.

¹⁹ That the Stoics did have this preference is argued by Goldschmidt, *op. cit.*, pp. 32–33, 42, 208–209 and 211–212.

it clear that time is the duration of a process of movement? But then why not of rest or stasis?²⁰

All of these questions are raised by the gaps in the extant texts, and for the same reason they cannot be answered convincingly. Nevertheless, there are some certainties. Like Aristotle and the classical atomists, the Stoics settled for a definition of time as the duration of an event and rejected the possibility of time without change or movement (whether or not they included rest). In elaborating this position, their acceptance of the continuity of things brought them appreciably closer to Aristotle than to Epicurus and his followers. Like the Epicureans, however, they fitted time into their ontology. In the first instance the outcome is still analogous because for both parties time is dependent on a primary entity (what is more, on more or less the same entity, namely the motions of matter), so that at most it exists by derivation. In the second instance, however, the divergences stand out because the two ontologies are so different in all other respects.

It is here, it seems to me, that we find the chief contribution of the Stoa. Moreover, it entailed an important consequence for the dependence of time on the soul.

The Stoics saw time as something lacking materiality or corporeality (as an *asomaton*). That is hardly surprising, since they already held the situations, events and thus also the changes and movements in which material bodies are involved to be lacking in materiality. Since the real world was material for them (in that respect they were materialists), time was not a part of the real world. But it was not considered entirely unreal either. It was not a fantasy, a figment of the imagination, or a Platonic Form. For the Stoics, time was still ‘something’, not ‘nothing’. It was given a place in their intermediate ontological category, between the category of corporeal things and that of pure fantasies. To the same intermediate category belonged place, the void and the *lekta* (‘sayables’ or ‘things said’).

These *lekta* consist of everything that is or can be said in language. They are non-material things that come about thanks to the soul, more specifically the rational part of the soul. The soul itself is material, according to the Stoa. However, it produces non-material things

²⁰ For criticism of the Stoic definition, see also Plotinus, *Enneads*, III.7.8 and Chapter V below.

which in turn can have enough of a connection with the material world to be able to have a certain reality. In an instructive discussion of the meaning and development of the term *lekton* among the Stoics, Gabriël Nuchelmans has suggested that at first they used the term to refer to something that was said about a thing and thus coincided with a predicate (*katègorèma*). Later the term was extended to everything that is said or even thought. This may explain why *lekta* were always thought to be connected with material things and thereby became not completely unreal. The suggestion that the Stoics thought that *lekta* could exist independently of what people say and think, as advanced by Benson Mates and I.M. Bochenski, is implausible and has been convincingly refuted by Nuchelmans.²¹

Could this shared ontological position of the *lekta* and of time mean that time has an affinity with the *lekta*? And does that in turn mean that the dependence on the soul of the *lekta* also applies to time? Do the *lekta* form the central group of the intermediate ontological category from which the status of time has to be interpreted too? There are grounds for answering these questions in the affirmative, not so much because the *lekta* play a central role of some kind in the logic and thus in the entire philosophical system of the Stoa, but above all because in their views on time the Stoics repeatedly point to the role of language (especially the forms of the verbs) and the mind.²² Various aspects of time, conceived as the interval of movement, apparently assume the operation of the rational soul, the rational capacity to think. From this it follows that, unlike the Epicureans, the Stoics held that time is not just a property of accidents involving arbitrary material bodies, but that it is also the product of a

²¹ Gabriël Nuchelmans, *Theories of the Proposition*, vol. 1, ch. 4, pp. 45–74; ch. 5, esp. pp. 85–87. For the Stoic conceptions of body and soul, see A.A. Long, ‘Soul and Body in Stoicism’; on the *lekta* esp. pp. 51–53. A brief survey of the main problems of interpretation relating to the intermediate ontological category is provided by Sorabji, op. cit., pp. 21–27; for a fuller discussion see Goldschmidt, op. cit., ch. I, *passim*. An older study that is still authoritative is E. Bréhier, *La théorie des incorporels dans l’ancien Stoïcisme*. That the *lekta* might be independent of the mind is also suggested by Jacques Brunschwig in ‘Stoic Metaphysics’, p. 218.

²² On language, see for example the concluding remark of Bréhier in his chapter on time in *La théorie des incorporels dans l’ancien Stoïcisme*, p. 59: ‘C’est que le temps ne s’appliquait directement qu’aux verbes, c’est-à-dire aux prédicats qui signifiaient pour eux les événements incorporels. Le temps n’a donc aucun contact avec l’être véritable des choses’. Cf. Turetzky, *Time*, pp. 41–42. At any rate, the relation of time and language is taken much further in the Stoa than by Epicurus.

specific substance, namely the rational soul. And unlike Aristotle, they held this to be the case not because of the need to count or measure, but because something is brought about in and by means of words and thoughts. Perhaps one might say: because a concept has to be fashioned.

This implies the need for some degree of differentiation. The closest to the *lekta* are the past, the future, and the instantaneous, infinitesimal present. Although they are not nothing, they only exist in thought. That is naturally the case for past and future, and it is true of the instantaneous present because this is the abstract limit of a process of division that can only take place in thought. Perhaps they *are lekta*. Matters are different, however, with regard to the present as a span of time, the present as the actual interval: the duration of an activity somebody is engaged on. This present is experienced through the senses and already for that reason it is partly of a material nature for the Stoa. That is why they explicitly state that it is the only portion of time that genuinely exists. But how long it lasts, the size of the interval in question, depends on the person in question! No doubt the person's soul will play a role in that too. The situation is different again as regards the standard periods for measuring time such as the day, the night, the phases of the moon, and the seasons. According to the Stoa, they are certainly material by nature and thus have the highest level of reality, but their relation with time is extremely indirect, according to both the definition of Zeno and Posidonius and that of Chrysippus and Apollodorus. According to the latter definition, a different period is connected with time, namely the period of the cosmic cycle, that in ontological terms is supposed to take precedence over the interval of any arbitrary movement.²³

There is thus above all a difference between time as an all-embracing and unlimited entity, and time as a succession of more or less material intervals. The former was also called *aiōn*, especially by Marcus Aurelius in a later phase. It is abstract, infinitely divisible and continuous; the latter is material and discrete. In *this* sense perhaps the Stoa did maintain that there were two times, two concepts of time,²⁴ but however that may be, the former is the main one, not

²³ See Goldschmidt, *op. cit.*, pp. 30–45, esp. 37–43.

²⁴ Turetzky claims that Chrysippus entertained two conceptions of time in this

only because it is the framework for the latter, but also because it forms the actual subject of the Stoic philosophy of time.

That is precisely why the Stoics did not attribute a large realistic content to time. The Epicureans had done the same. Neither school saw that as a reason to doubt the power, influence and importance of time. They by no means concluded that time does not matter or should be treated as an illusion. Time may be an accident of an accident or to a large extent the product of our own rational soul, and at any rate subordinate to matter (whether conceived as atomic or continuous), but for both schools it remains a factor of great importance. Even if it is in some respect something we produce, now that it exists we have to take it fully into account.

For besides the actual importance of time, there was a moral dimension. Epicurus and several Stoics recommended dealing wisely with time and adopting the correct attitude towards it. Their ethics are strikingly marked by time. A first reason for this was that, in contrast to Plato and Aristotle, eternity as the opposite of time does not play a role of any significance in their systems. Besides, there was a strong link between physics and ethics within these systems. In emphasising the moral importance of time they anticipated what was to become an extremely prominent theme in later centuries from Dante and Petrarch on. Today time has become a more compelling phenomenon than ever, if not an obsession—a subject to which I return in Chapter IX.

The elements of that view must go back a long way. For a very long period time must have been experienced as a great and fatal force. There must always have been forms of shortage of time and timing, for example in hunting and agriculture, on the battlefield and in commerce, in love and in revenge. The ancient philosophers were sometimes already more specific. Aristotle, for instance, had pointed out the power of time to bring about dissolution. In a striking passage in the *Physics* he argued that it is more characteristic of time to destroy than to create.²⁵ In the *Laws*, on the other hand,

sense; cf. *Time*, pp. 38–40. On the dual concept of time of the Stoa cf. also H.J. Pos, 'Het tweezijdig tijdsbegrip der Stoa'.

²⁵ *Physics*, I, 221a30–b3. Elsewhere (*De Anima*, 433b7) Aristotle had characterised humans as having an awareness of time because they are forward-looking. Cf. Gadamer, *Gesammelte Werke*, Vol. IV, pp. 139–140.

Plato had referred to fame and offspring as ways of acquiring a sort of immortality:²⁶ so the effect of time must be combatted *in* time, a point that has often been repeated since. The poet Horace, to name but one, foresaw a future for his work that would last very long indeed, longer than bronze (*aere perennius*), while his famous dictum *carpe diem* stressed the value of a sensible use of the present in everyday life.

In doing so, he was following in his own way the tradition that had been established in the meantime by Epicurus and the first Stoics. They in particular had insisted on the great importance of time for the good life. In their view, wisdom, happiness, satisfaction, tranquility and obligation are closely connected with the attitude towards time. Of course, that is not a simple question, because many different factors are at stake. It is essentially a question of a whole range of relations within which the two schools each highlighted certain aspects. In short, the Epicureans emphasised the value of durability and with it the importance of the long term, the significance of practical insight (*phronēsis*) and memory, while the Stoics stressed the demands and possibilities of the moment.

For Epicurus practical insight is above all necessary for achieving the right balance. The immediate satisfaction of desires is often overshadowed by negative consequences later on, while discomfort now can be amply compensated by good fortune earlier or later on. He therefore urges his pupils and friends to think of the long term whenever they choose or reject something. In doing so, the absence of disturbance (pain and fear) is to be preferred to the presence of pleasure, not because that is *comme il faut*, but because it is the most agreeable and natural. *Ataraxia*—freedom from fear in the soul, peace of mind—is the final goal.²⁷

The doctrine of the Stoics is marked by a strong sense of obligation, of an extreme kind at first, more liberal later. Time is and remains an important factor in this respect. What is more, it is very demanding. The opportunities of the moment are not for the enjoyable things but for the virtuous things, and in the ideal state of *apatheia* the emotions are even eliminated.²⁸

²⁶ *Laws*, 721b–c.

²⁷ Epicurus, *Letter to Menoikeus*.

²⁸ For a comprehensive study of the relation between time and morality in the Stoa, see Goldschmidt, *op. cit.*, chs II–IV.

The categorical demands of the moment (most important is to do what you must do *now*) have perhaps never been defended so eloquently as by Epictetus.²⁹ An important and permanent motive was the conviction that the reasonable soul must have fulfilled its life at every moment. In the words of Marcus Aurelius, the last of the classical Stoics, it must be able to say at whatever moment its life reaches its appointed limit: 'I have my work perfectly complete'.³⁰ No less influential was Seneca's first *Letter to Lucilius*, in which he advised him not to let time slip out of his grasp, and not to waste time through negligence but to deal with it sagely. 'If you will pay close heed to the problem, you will find that the largest portion of our life passes while we are doing ill, a goodly share while we are doing nothing, and the whole while we are doing that which is not to the purpose.' Nevertheless, Seneca sees time as something we own, a fleeting and precarious good, but no less a possession for all that. Time is even the only thing that nature has given us to possess: 'Nothing, Lucilius, is ours, except time'.³¹

Accompanied by a certain pessimism, it is a self-conscious clarion call that was to meet with a wide response in the Renaissance. However, it is in stark contrast to the sighs of Marcus Aurelius that bear witness to a sense of insignificance in the face of the bottomless abyss of time.³² Compared with time, everybody is disconcertingly unimportant. From that perspective, it may even have cost him an effort to retain a sense of the value of every present moment and the related sense of duty.³³ Fortunately he felt that there was a force in the opposite direction, the conviction that every being was connected with the whole cosmos. Sometimes an appeal to that conviction follows directly after a lament about nullity. That is understandable, for is there not a certain connection between the two?³⁴

²⁹ Epictetus, *Diatribes*, I.7.30–33.

³⁰ Marcus Aurelius, *Meditations*, XI.1.

³¹ *Omnia, Lucili, aliena sunt, tempus tantum nostrum est.* Seneca, *Letters to Lucilius* I, cited after the translation by R.M. Gummere.

³² Marcus Aurelius, *Meditations*, e.g. IV.3 and IV.50. He calls time *aiōn*; cf. p. 46.

³³ *Ibid.*, e.g. II.5.

³⁴ On Marcus Aurelius and time, see Goldschmidt, *op. cit.*, pp. 168–199, and J.M. Rist, *op. cit.*, pp. 283–288.

CHAPTER FIVE

THE TWO TIMES OF NEOPLATONISM

The Stoics were not the only ones to react intensively to Aristotle's work and to make use of it in some way in the centuries after his death. The same applies to the Sceptics, bitter opponents of the Stoa. They could seize on the doubt about the existence of time with which Aristotle began his analysis.

The founder of the Sceptic school was Pyrrho of Elis, a younger contemporary of Aristotle. His followers soon managed to take over the Academy founded by Plato, but their chief spokesman for us is Sextus Empiricus, who lived much later (around 200 AD). His work on Pyrrhonism has been preserved. It contains extensive attacks on the tenability of the concept of time.

According to Sextus, time possesses several kinds of contradictory properties. It cannot have had a beginning, for in that case there would have been a time before time; for a similar reason it can never come to an end. So time is unlimited. But if that is so, every part of time—not just the present, but the past and the future as well—must exist; for if only the present existed, time would be limited. But in that case the past and the future are also present in some way or another, which obviously cannot be the case. Thus time cannot be unlimited. In short, it is neither limited nor unlimited, or both at the same time. Analogous dilemmas arise in connection with the question of the divisibility or indivisibility of time.¹

All the same, it is likely that Sextus was not out to deny the reality of time. The so-called Sceptics contested existing opinions and refused to make a judgement of their own, but they did not deny what directly takes place in experience. That is probably where they placed time too, at least as long as no properties are attributed to it that are based on speculation and concerning which no well-

¹ For a succinct summary and interpretation of Sextus Empiricus' arguments, see Turetzky, *Time*, pp. 30–34.

grounded opinion can be obtained by reasoning either, for example because there is a stalemate between contradictory arguments, as in the case of limited-unlimited and divisible-indivisible. It is plausible that the question of whether time depends on the soul was also an undecided issue for them. Classical Scepticism had no opinion on the matter.

Of course, it was primarily the Aristotelians who continued to take Aristotle's work into account, but by no means were they uncritical. That can already be seen in the case of Strato, the third leader of the school, who not only introduced all kinds of innovations but also commented critically on Aristotle's definition of time, as was seen in the previous chapter.²

The question of the dependence on the soul was also examined more closely. Some rejected Aristotle's argumentation and conclusion, partly on grounds already mentioned in Chapter III. Others, on the other hand, went even further than Aristotle and adduced new arguments for why the soul or the mind are necessary for the existence of time.³ They included the highly influential commentator Alexander of Aphrodisias (ca. 200 AD), the author of a commentary on the *Physics* that is unfortunately no longer extant. Nevertheless, his ideas about time have been preserved in a short treatise *On time* (*De tempore*). Although the Greek original has been lost, the work is known from a ninth-century translation into Arabic that was translated into Latin three centuries later.⁴

Alexander claimed that the soul is necessary not only for the counting or measuring of movement, but also for the movement itself. After all, if there were no soul, the firmament would not rotate, since it owes its motion to the strivings of the heavenly spheres, and thus there would be no motion or change at all: all the more reason to conclude that there would then be no time.⁵ This line of reasoning recalls the implicit argumentation about the dependence of time on the soul in Plato.⁶ Alexander further maintained that time in itself forms a continuous entity, and that it only operates as plurality

² See p. 43.

³ For some details, see Sorabji, *Time, Creation and the Continuum*, p. 95.

⁴ An English translation with commentary was published in 1982: R.W. Sharples, 'Alexander of Aphrodisias, *On Time*'; cf. also Sorabji, op. cit., pp. 28–29 and 95–96.

⁵ Alexander of Aphrodisias, *De tempore*, 95.11–95.15 = Sharples, op. cit., p. 64.

⁶ See p. 23.

and as number in the mind.⁷ This is a variant of Aristotle's argument for the dependence of time on the rational part of the soul. At the same time, it is a striking reversal of the Stoic ontology of time, for in the Stoa time in the sense of a continuous, comprehensive entity was held to be a non-material product of the mind, while the co-existent actual intervals were taken to a certain extent to be material and present in the world. Upon closer inspection, however, the contrast is less pronounced than it appears, and not only because the identical terms that occur in the two systems do not have an identical content. In his conception of the instantaneous 'now', Alexander is in agreement with the Stoa, for he posited that the instant, unlike a point on a line, does not actually exist, but only occurs in the mind.⁸ In his view, that is how time is divided, for in itself it forms an indivisible, eternal entity. What is more, it turns out that this continuous entity, although it is called time in itself, is still not time, for Alexander repeatedly states that it is the instant that produces time.⁹ It is the instant, itself a product of the mind, that brings about real time. Consequently, Alexander attributes both the quantifiable and the changing and progressive character of time to the mind.

Alexander also departed from Aristotle in linking time primarily with the motion of the heavens instead of with movement in general. That resembles Plato, although Alexander criticised his followers on other points. It is important to ask which other opponents he had in mind in the strongly polemical first part of his treatise. It has been suggested that Galen was one of them. This supposition is based on the remarks of a few Arab authors that Alexander wrote a treatise against Galen's views on space and time. According to them, Galen took an absolute view of time, taking it to be independent of motion and change. Movements would provide us with a means of measuring time, but time itself was supposed to exist independently of them.¹⁰ And perhaps the polemical treatise referred to by these authors, or at least that part of it dealing with time, is the treatise *De tempore*.

⁷ Alexander of Aphrodisias, *De tempore*, 94.23–24, 97.5ff. = Sharples, pp. 62 and 67.

⁸ *Ibid.*, 94.28–34 = Sharples, pp. 62–63.

⁹ *Ibid.*, 94.35ff. and 95.32ff. = Sharples pp. 63 and 64–65.

¹⁰ Cf. Sharples, pp. 72–73.

This would be extremely interesting if it were all true, but unfortunately that is probably not the case. It may be that at a certain point Alexander outlined and combatted the contours of an absolute conception of time, a time that is independent of movement or change.¹¹ Strictly speaking, though, that remark only concerns the independence of time from the rotation of the firmament, and it certainly does not seem to yield a sustained contrary point of view. Moreover, it is in itself unlikely that Galen really entertained this absolute, almost Newtonian view.¹²

Rather than by combatting an early absolute conception of time, Alexander of Aphrodisias played a role as a precursor of later ideas concerning the dependence of time on the mind. They featured prominently in the Neoplatonism of Plotinus and his followers. More particularly, his distinction between time as a continuous unity (existing independently of the mind) and time as plurality (existing only in the mind) recurred in a stronger form in Iamblichus' distinction between a static and a flowing time (the former corresponding to the intellect, the latter to the soul and the senses). One of the implications of this stronger form is that Alexander's time-as-unity has acquired a certain absolute character in Iamblichus, which is rather ironic in the light of Alexander's (alleged) critique of the (alleged) absolutism of Galen.

At any rate, the views of the Neoplatonists on time appear to display a clearer affinity with the doctrine of time of the Aristotelian Alexander than with that of their official precursor, Philo of Alexandria. This Greco-Jewish philosopher from the beginning of the first century AD tried to reconcile Plato's *Timaeus* with the biblical account of creation. In his version, the world is created not by the demiurge but by God. Both of these created and ordered worlds have a beginning, and there is strong evidence to suggest that this meant for Philo that that was the moment when time commenced as well. In both cases, however, the problem of unordered matter arises. For the story of creation in the book of *Genesis* also speaks of prior chaos: desolate, void, and dark. Assuming that God created this chaos too, was that the first stage of the creation of the ordered world? If it

¹¹ *De tempore*, 93.22ff. = Sharples, pp. 60–61.

¹² Cf. Sorabji, *op. cit.*, pp. 82–83; for a full analysis, see Sharples, pp. 73–78.

was created earlier, on the other hand, did time thus exist before the creation of the cosmos? And if so, was this an amorphous time in contrast to the measurable time that only emerged with the creation of the ordered world, the cosmos?¹³

These questions are highly analogous to the questions raised by Timaeus' story of the construction of the world by the demiurge. It looks as if Philo had no clear-cut answer, or at any rate no permanent one. The commencement of time, and with it the age of time, remained unsolved questions for him. And there is no question of any dependence of time on a soul or mind in his case, not even in the implicit form that can be found in Plato. Plotinus, on the other hand, certainly did not believe that Plato intended time to commence with the cosmos in the *Timaeus*.¹⁴ That was not what the myth of the demiurge was supposed to mean, he claimed. Time, he posited, arose in and with the soul.

The third-century philosopher Plotinus was the founder and leading figure of Neoplatonism. His doctrine of time has contributed to that, and although it may not be a key element of his philosophy, it is certainly important. Together with those of Plato, Aristotle, and (later) Augustine, it towers above the others in the skyline of ancient philosophies of time. Of course, accidents in the transmission of texts have played a certain role in this, but they were not the decisive factor.

Plotinus' doctrine of time is mainly to be found in the seventh treatise of the third *Ennead*, which can be dated to his middle period. It is called *On eternity and time*, which he treats in that order. According to this extremely influential treatise, eternity is not simply rest or stasis, even though it certainly is connected with rest and motionlessness. It is what was not and will not be, but only is, and thus it has being as something that is motionless and does not change. Eternity is therefore also something very different from unlimited duration; it is life 'all together and full, completely without extension or interval', and that is directed exclusively towards the One, the source of everything.¹⁵ It is visible in the intelligible as something perfect that lacks nothing and to which nothing can be added.

¹³ On Philo and time see Sorabji, *ibid.*, esp. pp. 203–209.

¹⁴ Plotinus, *Enneads*, III.7.6; p. 317. (trans. A.H. Armstrong)

¹⁵ *Enneads* III.7.3 and 7.6.

While the things that are subject to ‘becoming’ immediately cease to exist once the ‘will be’ is taken away from them, the eternal things ‘fall from the seat of being’ if the ‘will be’ is added to them.¹⁶

But what is time? That question causes Plotinus more difficulty. The answer will also have to explain how we, who live in time, can know eternity and thereby share in it.¹⁷

Plotinus begins by refuting the most important of the earlier views, though without mentioning a single name. As eternity is not just motionlessness, time is not pure motion of any kind either, not even that of the heavenly bodies. And if it is not the motion of the firmament, then it is certainly not the firmament itself—a view that has been attributed to Pythagoras. Since movement takes place *in* time, time cannot be an aspect or property of movement. Least enlightening, according to Plotinus, is the Epicurean variant of this idea because it only states that time is an accessory, fortuitous property of what takes place, without saying anything else about the nature of that property. What makes this property of the moving constellations of atoms precisely *time*? Besides, if it accompanies movement, it must do so in one way or another in time (later than, simultaneously with, or prior to movement), so this definition already presupposes time. Plotinus discusses the Stoic view in more detail. The crux here is the indeterminacy of the concept of *diastēma*. If this is taken to refer to a spatial distance, it can of course be measured, but it is impossible to use it to define time; if it refers to something in the movement itself, then time is located in the movement where it is not to be found;¹⁸ and finally, if a temporal dimension is intended, the definition is circular.

It is a well-crafted argument. The most intriguing part, however, is the refutation of Aristotle’s view of time as the measure of movement in relation to prior and posterior.¹⁹ What is used to measure

¹⁶ *Enneads* III.7.4; p. 307.

¹⁷ For a detailed analysis see Gordon H. Clark, ‘The theory of time in Plotinus’, and Andrew Smith, ‘Eternity and Time’, in Gerson (ed.), *The Cambridge Companion to Plotinus*, pp. 196–216. Cf. also the explanation and commentary by Werner Beierwaltes in *Plotinus, Über Ewigkeit und Zeit (Enneade III.7)*.

¹⁸ ‘And if one, looking at movement, shows that it is multiple [...], time will not appear or come into one’s mind but movement which keeps on coming again and again, just like water flowing which keeps on coming again and again, and the distance observed in it.’ *Enneads* III.7.8; p. 325.

¹⁹ *Enneads* III.7.9; Plotinus has incorporated a good deal of Aristotelianism in his system.

the movement in terms of prior and posterior, Plotinus remarks, is a specific length of time, not time itself. Nevertheless, that which measures movement—‘time measuring’—must be bound to time, for the number in question seems to be:

[. . .] the number which runs beside the movement and measures it by the sequence of “before” and “after”. But it is not yet clear what this number which measures by the sequence of “before” and “after” is. And then, too, anyone who measures by “before” and “after”, either with a point or with anything else, will in any case be measuring according to time. So, then, this time of theirs which measures movement by “before” and “after” is bound to time and in contact with time in order to measure. [. . .] Time, then, is something different from the number which measures by “before” and “after”. [. . .] But again, since time is, and is said to be, unbounded, how could it have a number?²⁰

In passing, Plotinus here also pinpoints the problem already discussed in Chapter III: that of whether, according to Aristotle, motion is measured with *nows* (in other words, with instants) or with units of duration. And in the same context he deals with Aristotle’s arguments for the dependence of time on the soul with a couple of powerful rhetorical questions. He has no sympathy with Aristotle’s mental constructivism:

Then, why, when number is added to movement [. . .], why should time result from its presence, though when movement exists and, certainly, has a “before” and “after” belonging to it, there will be no time? This is like saying that a magnitude would not be the size it is unless someone understood that it was that size. [. . .] But why can time not exist before the soul which measures it? Unless perhaps one is going to say that it originated from soul. But this is not in any way necessary because of measuring it, for it exists in its full length, even if no one measures it.²¹

Plotinus does believe that time is completely dependent on the soul, however, but for very different reasons from those of Aristotle. It is Plotinus himself who declares that time originates in the soul, as announced in the penultimate sentence of the above citation and explained in the remaining sections of the treatise.

²⁰ *Ibid.*; pp. 333–335.

²¹ *Ibid.*; pp. 333–335.

Following in the footsteps of Plato, who is mentioned (repeatedly) by name, Plotinus assumes that time is an image of eternity, as in general the visible world is an image of the intelligible world. As mentioned in Chapter II, Rémi Brague has argued that Plotinus was thereby one of the major sources of the common but (in his view) incorrect reading of the passage on time and eternity in the *Tīmaeus*. According to Plotinus himself, it was a mistake to suppose that Plato claimed that the motions of the heavens form time. Plato, he believed, meant that the celestial motions bring time to light. The world moves in the time of the soul, and so time should not be conceived outside the soul either. This line of thought has no need of a demiurge.

For Plotinus as well as for Plato, the origin of time is part of a grandiose vision of the origin of the world. The origin of everything is here the One, also called the Good, the highest and completely transcendent reality. From that the mind, the world of intelligible beings, arises by emanation or illumination. In turn, the mind produces the soul, which then produces the visible world as the following emanation.²² The mind corresponds here to some extent to the primeval model in the myth of *Tīmaeus* according to which the demiurge fashioned the cosmos, although Plotinus allows the soul to do the work itself. Through its position in the hierarchy of successive hypostases, and above all through its activity, it is the soul that links the invisible, eternal world of the mind with the perceptible world in time, the world of living beings, bodies and matter. As in the *Tīmaeus*, it partakes of both.

More particularly, the soul regulates the transition from eternity to time. It is present in the entire visible world as the soul of the cosmos and as the soul of all living beings. Hence each soul does not have its own time; the singular time that embraces everybody and everything exists in this one cosmic soul; it is the motion or life of the soul. And it is also thanks to the soul that we who exist in time can nevertheless know eternity.

In section 11 of his treatise, Plotinus offers his own mythical presentation of the creation of time by the eternal soul. He supposes that time tells the story of its origin itself. It is almost as though in

²² This recalls the Greek conception of the soul as the principle of animation, life and autonomous movement.

doing so he wants to outdo Timaeus as spokesman, although he does not claim to be able to cite time literally:

[. . .] that before, when it had not yet, in fact, produced this “before” or felt the need of the “after”, it was at rest with eternity in real being; it was not yet time, but itself, too, kept quiet in that. But since there was a restlessly active nature which wanted to control itself and be on its own, and chose to seek for more than its present state, this moved, and time moved with it; and so, always moving on to the “next” and the “after” [. . .], we made a long stretch of our journey and constructed time as an image of eternity. For because soul had an unquiet power, which wanted to keep on transferring what it saw there to something else, it did not want the whole to be present to it all together; and, as from a quiet seed the formative principle, unfolding itself, advances, as it thinks, to largeness, but does away with the largeness by division and, instead of keeping its unity in itself, squanders it outside itself and so goes forward to a weaker extension; in the same way Soul, making the world of sense in imitation of that other world, moving with a motion which is not that which exists There, but like it, and intending to be an image of it, first of all put itself into time, which it made instead of eternity, and then handed over that which came into being as a slave to time, by making the whole of it exist in time and encompassing all its ways with time.²³

This development of time from eternity is also a fall from eternity. Plotinus does not see the move from emanation to emanation as an improvement. On the contrary, it is as though he regards every process of growth, such as the germination of a seed, as something that only has the semblance of enrichment, but is in fact an impoverishment. His ideal is for everything to remain together and undivided.²⁴

It goes without saying that the series of emanations from the first hypostasis, the transcendent divine One, is not itself intended as a temporal series, but as a logical and ontological one. The fact that Plotinus considered that Timaeus’ story about the construction of the world had no temporal dimension is a further reason to think so. So there is no need for time to be younger than the soul, although it is certainly not older; there can of course be no question of a time prior to the soul. It is even debatable whether time can be

²³ *Enneads*, III.7.11; pp. 337–339.

²⁴ *Enneads*, IV.8.6 is more positive on growth and development.

older than the individual soul of one human being, not because time was created simultaneously with us (human souls have no privileged role in the dependence of time on the soul), but because every individual soul in the last resort belongs to the world soul, and is even in principle one with the absolute soul, although it is capable of separating itself temporarily or even permanently from that soul.²⁵

After Plotinus' impassioned presentation of the birth of time, the final two sections of the treatise resume the critique of the Aristotelian conception of time. Plotinus concludes that the motion of the universe can be measured with time, but that this does not determine the essence of time; it is only by chance that it clarifies the magnitude, that is the duration, of movement.²⁶ The reverse is in fact the case: time is measured by the perceptible movements. In reality, however, it is the movement of the soul that has produced time and that determines its essence. That is why time has no intrinsic connection at all with the measure or number of any visible movement of any kind. The omnipresence of time in this world already rests on the omnipresence of the soul.²⁷

Elsewhere Plotinus also discusses matter, the absolute opposite of the divine One or Good. He first did so in one of his early treatises, where he distinguished two kinds of matter: the high, divine matter of the intelligible world, and the other matter of the perceptible world. Like divine matter, the matter of the perceptible world is still a product of the emanation from above, although of course over a much larger distance. It is not even formless in all respects, because it receives forms, but, unlike the divine matter, it has nothing of its own. That makes it bad, for 'that which has nothing because it is in want, or rather is want, must necessarily be evil' since it lacks everything: it is 'want of thought, want of virtue, of beauty, strength, shape, form, quality'.²⁸ Predictably, the absolute opposite of Good is Evil.

That conclusion is presented in a somewhat more forceful manner in one of Plotinus' very last treatises, *On the nature and origin of evil things*. The matter of the perceptible world is completely without

²⁵ Some nuances are added to this picture by J.M. Rist, *Plotinus: The Road to Reality*, ch. 9, esp. pp. 126–127.

²⁶ *Enneads*, III.7.12.

²⁷ *Enneads*, III.7.13.

²⁸ *Enneads*, II.4.16; p. 149.

dimension, form or determinacy right from the start. Strictly speaking it *is* not. It is non-being as opposed to being, only as such it is still necessary for the creation of the universe and an inevitable last result of the primeval beginning. But the emanation from above is darkened when the soul descends into it:

This is the fall of the soul, to come in this way to matter and to become weak, because all its powers do not come into action; matter hinders them from coming by occupying the place which soul holds and producing a kind of cramped condition, and making evil what it has got hold of by a sort of theft—until soul manages to escape back to its higher state. So matter is the cause of the soul's weakness and vice: it is then itself evil before soul and is primary evil.²⁹

This harsh verdict is not entirely fair. After all, the soul had created matter itself through experiencing affections, and had become evil by surrendering to matter.³⁰ But fair or not, it underlines the striking parallel between Good and Evil, between the ineffable and undefinable One, on the one hand, and the equally ineffable and undefinable Other, on the other hand; between the first and the last, which turns out to be another first (the first evil). And once again the words 'first' and 'last' have no temporal connotations. Now, however, that non-temporal character acquires an extra significance, since there are grounds for supposing that Good and Evil, which already proved to be analogous in several ways, also display an analogy in their timelessness.

They both stand outside time. Expressed quasi-temporally: time is not yet in Good, time is no longer in Evil. In the first case time has not yet been produced by the soul; in the second the soul has become impotent and all its capacities have lost their activity, so that time has been lost too. Time is here not defined as the measure of movement, but what is absolutely without any measure lacks time as well. The realm of time is also the realm of the soul, and that lies between absolute Good (together with its first emanation,

²⁹ *Enneads*, I.8.14; p. 315.

³⁰ For a rehabilitation of matter at the expense of the individual soul along these lines, see J.M. Rist, *op. cit.*, ch. 9, esp. pp. 126–129. That chapter offers a decidedly monistic interpretation of Plotinus' view of the world. Rist's argument is questioned by Denis O'Brien, who also interprets Plotinus monistically, but attempts to get the soul(s) off the hook. That is not entirely convincing. See O'Brien, 'Plotinus on matter and evil', in Gerson (ed.), *The Cambridge Companion to Plotinus*, pp. 171–195.

the mind) and absolute Evil, between the divine and the cast out. This situation recalls the *Timaeus*, where time—at least the time that is situated in the rotations of the heavens—does not apply to the eternal model, nor to the primeval matter that lacks form and order.

One of the debates among interpreters of Plotinus is the question of whether his system is monistic or, in the last resort, dualistic. Surely, the two poles of Good and Evil are connected, and Good is the primary pole; but in the end there are two principles. Less dubious is the statement that the regime of time lies between the two poles. The poles themselves are timeless.

Does that mean that the two poles are eternal? Certainly not, neither of them. For Plotinus, eternity belongs primarily to the mind, to the world of intelligible being, and secondarily to the soul in so far as it is loyal to its origin. Of course, eternity is very closely connected with the One; but that is so because it is exclusively orientated towards it, not because it coincides with it or is in it.³¹ On the contrary, eternity is situated *around* the One, in its first emanations. It therefore does not belong to pure matter or Evil either, because there is by definition no orientation towards the One here. In short, one cannot go any further than the characteristic of timelessness for both Good and Evil, especially as nothing positive can be said about the two poles anyway.

Thus eternity, like time, is situated between these two poles. Eternity and time share the area between them: eternity close to the One, time close to the 'Other'. The poles themselves stand outside both time and eternity.

The picture becomes somewhat more complex among the followers of Plotinus. No matter how much they respected him, they took liberties with his intellectual legacy. Already around 300 AD Iamblichus began to extend the system of hypostases. He added further ones, as well as sub-emanations. It is questionable whether this marked an improvement. A common explanation, namely that the later Neoplatonists wanted to make room for the gods of popular oriental religions, inspires little confidence in their necessity. However, there were other motives, one of them connected with the doctrine

³¹ *Enneads*, III.7.6.

of time. There is no reason for scepticism on that point. Iamblichus introduced an extremely interesting new element here. His philosophy of time is not only important in itself, but it has also proven to be fertile in history.

In developing his ideas, Iamblichus appealed to a Pythagorean philosopher who must have lived a couple of centuries earlier and whom he called Archytas, or whose ideas he ascribed to Archytas. Since Archytas was actually a contemporary of Plato, the source of Iamblichus' inspiration is now commonly referred to as pseudo-Archytas.

As Simplicius presents it, this pseudo-Archytas believed, like Aristotle, that although the series of *nows* differ in terms of content, they share an identical form. They are, as it were, the constant dip in a V-shaped line whose two halves represent the past and the future. The dip is moving along the line all the time, but in such a way that the line always maintains the same V-shape. That dip also moves continuously from earlier to later along another line, but this time a straight and unbroken line that represents the fixed axis of time. So time is here represented as being divided between two lines: the broken line with the shifting dip, and the constant straight line. In Iamblichus' conception, there were now two concepts of time, in fact two times, each with its own *now*.

Equally in agreement with a remark of Aristotle, pseudo-Archytas attributed no reality to the past or the future. Besides, he argued, it was hardly possible to call the constantly shifting *now* a reality either. However, it was indivisible. That was a serious problem for Iamblichus, because he held precisely the intelligible things, which were also real in the highest degree, to be indivisible. Unreal and indivisible could not go together. Iamblichus' path-breaking solution, according to Proclus and Simplicius, was a further elaboration of the idea of the double nature of time that he claimed to have found in pseudo-Archytas.

According to Iamblichus, there was on the one hand the indivisible, static time within the world of the mind, and on the other the unreal, divisible and moving time in the world of change. The former is a fixed, comprehensive ordering with a static *now* (a permanent instant, as it were), and is, like Plato's Forms, the unchangeable foundation of what is subject to change. The latter consists by virtue of succession, in which not only the *now* is divided, but past and future arise and the one passes into the other. Everything that hap-

pens does so in this second time. Nevertheless, the first, higher time shares itself to some extent with the second, lower time, which thereby partakes of the first. Of course, they by no means coincide, because they are rigorously different as unchangeability and changeability, motionlessness and flow, indivisibility and divisibility. In fact, the first, static time is true time, and the second is derived from it. That is hardly surprising. All the same, there is an essential interference between the two levels.

This innovation entailed moving the creation of time one level higher in the ontological hierarchy than had been the case in Plotinus' system, for according to Iamblichus the first time is no longer the product of the soul, but of the mind or the intellect. Although he maintained absolute rest and timelessness for the world of the Forms (the beings), he introduced an extra level—thought—below them, and it is there that he placed time as an exemplary ordering: partaking of the higher eternity, and yet caught up in a certain dynamic. In turn, the lower time of the soul and the senses partook of the higher time of thought. Something of the exemplary order continued to exist in it, albeit in combination with the changeability and irreality characteristic of the lower level. It is here, one is tempted to say, that the real prior-and-posterior and the real now arise, even though in Iamblichus' terms they have become less real compared with the static distinction between prior and posterior at the intellectual level, which is where genuine time is in the last resort to be found.

Vice versa, time only takes on motion because movements participate in the unmoving time that determines them. With a reference to Iamblichus, Proclus has described this situation succinctly:

Time is thus moving not *per se*, but by the participation in it appearing in the movements and measuring and defining them [. . .]. In this way time moves as possessing the cause of the activity proceeding outside from it and perceived as divisible in the movements and being extended together with them. Thus in the same way as the movements become temporal through participation, time moves through being participated in by the movements.³²

³² Cited in Sambursky and Pines, *The Concept of Time in Late Neoplatonism*, p. 47. This book also contains other fragments and commentary on pseudo-Archytas and Iamblichus. Cf. also Sorabji, *op. cit.*, ch. 3, esp. pp. 37–41, and Turetzky, *Time*, pp. 51–54, where the division carried out by Iamblichus is compared with the dualism that Chrysippus had noted.

Eternity, the intellectual static time, and the moving time of the soul, that on the one hand partakes of the intellectual time and on the other is only moving because the movements participate in it—those are in the last resort the stages of the origin of time according to Iamblichus. Movement and change have no importance of their own, and in spite of the above citation, it would be wrong, according to this theory, to start from movement in order to arrive at a proper understanding of time. Movement need not even be the starting point for our *knowledge* of time. The fragment cited above continues with a critique of the physicists who see this differently: ‘With reference to it the physicists believed time to be that which can be counted in movement, since they could not perceive its cause’. But although this cause cannot be perceived, the Neoplatonists believed that it can be known.

The difference from Aristotle, the atomists and the Stoa is radical. On the other hand, there is naturally a correspondence to Plato’s vision. That correspondence is even clearer in the case of Iamblichus than it was with Plotinus. Time in Iamblichus comes more explicitly from above, its origin is situated at a higher level, and right to the end time retains something of the very first paragon, eternity; in Plotinus the contrast between time and eternity is actually heightened. The dual approach to time, however, is not Platonic; but Alexander of Aphrodisias had taken a step in that direction.

What is even more striking is the correspondence to a contribution from much later, namely the analysis of the concept of time by the twentieth-century idealist philosopher John McTaggart. McTaggart also divides the concept of time into two: on the one hand, the static system on the basis of the relations prior, later and synchronous, on the other hand, the changing system of past, present and future. The latter system is fundamental for time in McTaggart’s analysis, as well as forming the basis of its irreality (see Chapter XIII).³³

For the time being there were still interesting developments taking place in Neoplatonism. In the fifth and sixth centuries Proclus, Damascius and Simplicius were to elaborate Iamblichus’ ideas further. It is above all noteworthy that they seized on the spatialisation

³³ This parallel has been discussed by Sorabji, *op. cit.*, pp. 38–39. Sorabji argues that Iamblichus’ moving time corresponds closely to McTaggart’s system of changeable time, but that his static time is not a close match to the latter’s static system.

of time that played a role in the scheme that Iamblichus had taken from pseudo-Archytas. Two centuries later, around 500 AD, this spatialisation was to reach a striking climax in the work of Damascius. He compared time standing still with a motionless river, a river that begins to flow in the world of the soul and the senses. It is equally striking that he conceives of that flow in spurts, since he considered that the successive elements have a small, finite duration, which can only be broken down further in thought. He called these elements 'leaps', and argued that they pass from one to another. In this way he hoped to rescue both the present and motion from the arguments that they cannot exist. Damascius thus advocated a discontinuous time, one of the few in antiquity, at least outside the Epicurean school, to do so. He does not appear to have found much support among his fellow Neoplatonists. His pupil Simplicius rejected the leaps; he even rejected the image of time standing still. It may have been to replace it that he drew attention to an image of time that the Pythagoreans were supposed to entertain, in which time was seen as a sort of dance of the soul around the intellect, or a circular dance of the Now. Once again, this striking image was a spatial one.³⁴

In the meantime the spatialisation of time had also received a strong impulse in the work of Augustine in connection with his new focus on the role of the soul.

³⁴ For Proclus, Damascius and Simplicius, see Sambursky and Pines, *op. cit.*; Simplicius' version of the Pythagorean image of time as a dance on pp. 27 and 35. Cf. Sorabji, *op. cit.*, p. 42 and ch. 5, which is mainly concerned with Damascius; Sorabji criticises the interpretation of Damascius' ideas advanced by Sambursky and Pines.

CHAPTER SIX

SAINT AUGUSTINE: TWO TIMES AND TWO CREATIONS

Augustine's doctrine of time can be found in Book XI of his famous *Confessions*. Augustine wrote this work during the first years of his appointment as Bishop of Hippo, i.e. in the last years of the fourth century; it must have been completed by about 400 AD. The first nine books present a description of his life, with commentary, down to shortly after his conversion. This chronological account stops with the death of Augustine's mother Monica in Ostia as they are returning together to Africa.

The last four books have a different character. Book X deals with the question of how one can come to God; memory is assigned a key role in that process in a long, fascinating passage, after which Augustine discusses the main temptations to which he is still exposed. Books XI, XII and XIII contain mainly theological disquisitions on the creation of the world as described in the first chapter of *Genesis*. It is in this connection that the question of time is raised. The account of Augustine's life no longer plays a role here, and there are no more confessions. But the praise of God is still a constant theme, and in that sense the title *Confessions* still applies to this section. Many of Augustine's almost desperate attempts to comprehend the riddles of the creation and of time are addressed directly to God.¹

God created heaven and earth by his word. That word, however, was not spoken in time, because time did not exist until after the world had been created. The words that God spoke about Jesus: 'This is my beloved son'² could ring out in time through the motion of something that had already been created ('motion subject to the

¹ For a beautiful and illuminating study of Book XI of the *Confessions* see E.P. Meijering, *Augustinus über Schöpfung, Ewigkeit und Zeit*. Paul Ricoeur offers an incisive account in the opening pages of his *Temps et Récit*. Much information about the influence of Augustine's doctrine of time in the Middle Ages and in the modern era can be found in Kurt Flasch, *Was ist Zeit?*

² *Matthew* 3:17 and 17:5.

laws of time, although it served your eternal will'), but the situation was different regarding the words with which God created the world. Augustine reasoned as follows: if God had created the world with words that sounded and then died away, something would have had to be created first which could lend itself as a mouthpiece for those words spoken in time; but there is no such prior thing; and if there had been, it in turn would have had to be created by an utterance outside time to enable the later words spoken in time to be uttered.³ A fortiori, it is foolish to ask what God did before he created the world, for there is no time outside the creation. God creates from 'the eternity which is for ever still' in which nothing elapses, so that 'both the past and the future have their beginning and their end in the eternal present'.⁴

So God created time along with the world. '*The day is thine, the night also is thine*', wrote the psalmist, 'no moment of time passes except by your will'.⁵ Augustine presents the same idea later in the text: 'When you had not made anything, there was no time, because time itself was of your making', and, even more succinctly: 'You are the Maker of all time'.⁶

But what, then, *is* time? We know it because we have no difficulty with it in our everyday speaking and doing, but that knowledge melts away once we want to explain it. 'I know well enough what it is, provided that nobody asks me; but if I am asked what it is and try to explain, I am baffled'.⁷ Indeed, how can time exist if past and future do not exist and the present is an elusive moment that is immediately gone again? Times that continued to exist would no longer be times; a present that does not pass would be an eternity. And yet, we still speak so easily about a long and a short time. How do we know that? Or rather, how do we measure that?

Of course, we can only measure the present as it passes, because the future and the past are not at hand. That also applies to the minimal form of measurement that is repeatedly here in question: the comparison of periods in terms of long and short, longer and

³ *Conf.* XI.6.8.

⁴ *Conf.* XI.11.13. (trans. R.S. Pine-Coffin).

⁵ *Conf.* XI.2.3, from *Psalms* 74:16.

⁶ *Conf.* XI.14.17 and XI.13.15. For the simultaneous creation of time and the world cf. also *Conf.* VII.15.21 and *De Civ. Dei*, XI.6 and XII.15–16.

⁷ *Conf.* XI.14.17.

shorter. One may claim to be able to see something in the past or in the future, but all that one sees are its images, traces or signs. Augustine thus arrives at the conclusion that the times that exist are not past, present and future, but our memory, our perception, and our expectation. All three are aspects or modalities of the present:

There are [. . .] a present of past things, a present of present things, and a present of future things. Some such different times do exist in the mind, but nowhere else that I can see. The present of past things is the memory; the present of present things is direct perception; and the present of future things is expectation. If we may speak in these terms, I can see three times and I admit that they do exist.⁸

We measure time in the process of passing, but only if it stays, for—to repeat—something that is not cannot be measured. So that passing is merely called so. Furthermore, it is certain that time could not arise from the movements of the sun, moon and stars. If they were to stand still, the rotation of a potter's wheel would still bear witness to time. The movements of the heavens indicate at most a unit like the day, but that period would continue to exist if the heavenly bodies were to rotate slower or faster, irrespective of whether we would still call it 'day' under those conditions. It is not a question of such units, but of time itself. That time must be a present extension, Augustine concludes, an extension of the mind (*distentio animi*).⁹

This solution astounds him, but he cannot see any alternative. He has raised the question of the possibility of measuring time (something that we are uncontroversibly doing all the time), he provides new examples, and he concludes again that time is measured in the mind. Exceptionally, Augustine now addresses mind instead of God:

It is in you, O my mind, that I measure time. Do not bring against me, do not bring against yourself the disorderly throng of your impressions. In you, I say, I measure time. What I measure is the impress produced in you by things as they pass and abiding in you when they have passed: and it is present. I do not measure the things themselves whose passage produced the impress; it is the impress that I measure when I measure time.¹⁰

⁸ *Conf.* XI.20.26.

⁹ *Conf.* XI.26.33.

¹⁰ *Conf.* XI.27.36. (trans. F.J. Sneed)

Only through the mind can the past increase and the future decrease as the future becomes past. Augustine even goes so far as to deny that a future and a past can be long, because neither of them exists; long in the future is only a long expectation of the future, long in the past is only a long memory of the past.

Augustine's response to his explicit question of what time is and to his underlying question of how time can be measured is wrestled from uncertainty, and that uncertainty is not dispensed with entirely. Down to the very end, the discourse on time proves to be an aporia, as Paul Ricoeur in particular has shown.¹¹ Still, there *is* an answer: time is an extension of the mind in three directions. The mind is thus the foundation, indeed the medium of time. Time, the duration of change and rest, is measured in and by the mind. It is understandable that Augustine's doctrine of time has been classified as a psychological doctrine. Richard Sorabji even categorises it as philosophical idealism.¹²

But what kind of mind is this? Although Augustine was influenced by Neoplatonism, we are here far removed from the conceptions of mind and soul to be found in Plotinus and his successors. The terms *anima* and *animus* refer neither to the unchanging world of the intelligible beings nor to the cosmic soul to which the individual souls belong. On one occasion Augustine even refers explicitly to 'my soul' as the place where he measures time,¹³ and that is in line not only with the immediate context but also with the entire train of thought, which displays a strong personal engagement. Sometimes, however, the context is more general. Soon after the passage quoted above on how, strictly speaking, a long future and a long past should be understood, Augustine supposes that he is about to recite a psalm by heart; the present act of attention is divided between the expectation of what is to come and the memory of what has been. He concludes that the same applies in other contexts, both larger and smaller: 'It is the same for the whole life of man, of which all a man's actions are parts: and likewise for the whole history of the human race, of which all the lives of all men are parts'.¹⁴

¹¹ Paul Ricoeur, *Temps et Récit* I, pp. 19–53; *Time and Narrative* I, pp. 5–30.

¹² Sorabji, *Time, Creation and the Continuum*, p. 29.

¹³ *Conf.* XI.27.36.

¹⁴ *Conf.* XI.28.38.

This means first of all that we all experience and measure the time in our minds, and further that the time of the world passes in our minds. Augustine tacitly assumes that we all measure the same thing, and that the torch is passed on from one generation to another. The time of the world is the result of the time of successive human lives, like a thread composed of countless small fibres, each consisting of the extension within an individual mind. There is no reason to suppose that Augustine takes a suprapersonal mind into account. In a slightly later passage he does suggest the possibility that there might be a mind to whom all past and future things would be known and which for that reason would command admiration and strike us silent with awe,¹⁵ but that is not the case here, and Augustine probably does not believe in it anyway. As in Wittgenstein's use of the same figure, the strength of the total thread is guaranteed by the number and overlapping of the individual fibres.¹⁶ No doubt in Augustine too, that interweaving is to a large extent the result of our common speaking about time, which can be unproblematic because (at least from our point of view) it is itself responsible for that interweaving and coordination.

There are no a priori grounds to think in this way. The same series of events might appear long in the memory of one person and short in that of somebody else. The same is true of the expectation of future events. Augustine does not even mention this problem, although it could easily have led to a new exclamation on the enigmatic nature of time. His trust in that interpersonal comprehension is implicit and apparently unquestioning. To understand this, one must of course take into account the availability of convenient standards such as the day and the year. In our conventional speaking about and making use of time, whereby the single, overarching world time emerges, we benefit from that to a large extent.

However, it is hard to resist the conclusion that Augustine had a second, perhaps even more important reason to simply assume the mutual coordination of the diverse mental extensions. That second reason concerns the role of God, though not because the mind of God would have an extension of memory, perception and expectation as the foundation of the time of the world. God sees everything that takes place in time, it is true, but he does not see it in time,

¹⁵ *Conf.* XI.31.41.

¹⁶ Wittgenstein, *Philosophical Investigations*, I, § 67.

temporally. This is asserted in two crucial passages: the first and the last sections of Book XI. No, once again it is about the fact that God created time together with the world. Augustine had stated it a few times before he raised the question of the nature of time, and although it sometimes looks as though in his desperate search for the answer to that question he has forgotten it, that cannot really have been the case. It above all must have led to his a priori trust in that mutual coordination.

In solving one problem, however, God's creation of time entails another, for humanity, and thus more in particular the human mind, plays no part at all in the creation of time. 'There can be no time apart from creation', Augustine remarks,¹⁷ and although strictly speaking he only states that the creation is a necessary condition for the emergence of time, the tacit implication is that time exists in, by and with the creation. Time is brought into existence with the creation. That a certain mental extension was necessary in the creation for that purpose is nowhere stated—let alone that time in itself would be such a mental extension. In *The City of God* Augustine was quite explicit: there was a time before humanity existed, and time probably arose with the movements of the angels.¹⁸

In short, the conclusion emerges that essentially there are two times in Augustine, as in Iamblichus. One is the time that was created by God along with the whole of creation. The other is the time that we experience and measure and that exists in a certain extension of our minds. Augustine's doctrine of time is primarily concerned with the second time: the way in which we deal with time, how we know it, what time is and can be for us. That doctrine is compatible with the claim that time was created by God when he called this world into being, and Augustine finally returns to the perspective of the creation again, but in the meantime he had distanced himself considerably from this point of view.

Once the world has been created, there is change and there are things with a beginning and an end. Something takes place, and what takes place has an order in time. That can be described, at least in retrospect, with words like 'at first', 'later', 'before', 'after', and 'then'. While there can be no 'then' in eternity,¹⁹ it exists from

¹⁷ *Conf.* XI.30.40.

¹⁸ *De Civ. Dei* XII.16. Cf. *Conf.* XI.6.8.

¹⁹ *Conf.* XI.13.15.

the very first in the creation. So time existed *then* too, and it may be assumed that it contained time-spans of an objective duration. None of this depends on any human contribution or on anything that is essentially human. There was no sense of time yet, there were no words to describe time, and no humans to measure time. Since this is the first appearance of time, it might be called the oldest time. However, there is no need to assume that the creation of humans and their minds came later, because the same thing can be expressed in non-temporal terms: in Augustine's vision, time is created independently of humans and of their mind or soul. This is his first time.

Besides that, there is the time experienced by us humans, who live in time and are subject to it. Many commentators, including Ricoeur, recognise this by characterising time as analysed by Augustine as human time, but they often forget to note that Augustine's discourse also contains a non-human time, a time that exists independently of humanity.²⁰

Incidentally, it is clear that Augustine perceived a close connection between the two times. The first time must be supposed to contribute, perhaps decisively, to the mutual coordination of all forms and variants of the second time. In some way or another the second time must proceed from the first, be based on it, be orientated towards it, and perhaps even be a reflection of it. Indirectly, of course, the second time is also a divine creation, since God created both the first time and the human mind.

It is interesting to see that Augustine has not only two times but also two creations. He even makes the latter distinction, unlike the former one, explicit, for when he goes into the story of creation in detail in Book XII of the *Confessions*, he argues that there is a profound difference between *Genesis* 1:1–2 (when 'the earth was without form, and void; and darkness was upon the face of the deep') and the account of the six days of creation in *Genesis* 1:3–31. The possibility of two creations had already been raised before, notably by Philo,²¹

²⁰ Ricoeur, *op. cit.*, e.g. pp. 30 and 53 (= *TN* pp. 13 and 30). The idea that there are two different, albeit interconnected, times in Augustine has not passed without criticism. Flasch, *op. cit.*, p. 193 points out that nobody assumed the existence of such a double temporality in Augustine in the Middle Ages.

²¹ See pp. 53–54.

but Augustine developed a clear view of his own with regard to this problem.

The heaven, that is created 'in the beginning', is, according to Augustine, the divine heaven, the house of God, the heaven of heavens referred to in one of the Psalms.²² The earth corresponding to it is the earth that is invisible and without form. Order and differentiation are introduced to this earth during the six days of creation, when the earth in the narrower sense with land and sea, and the heaven above it with all the heavenly bodies, are created.²³ It is not until then that time originates. The 'first' heaven and the 'first' earth are timeless according to Augustine. The first heaven is not eternal in the same way as the Trinity, but it shares in that eternity to a large extent. A change in the state of the angels is not a priori ruled out, but through incessant contemplation of God they suppress any possibility of it and thereby any commencement of real temporality. The first earth in its complete formlessness is perhaps temporal by disposition, but it is still without time.²⁴

Time originated with the first day, when light was made in the material world. 'Before then', so to speak, the spiritual beings that inhabit the heaven could not know time because it did not exist. On the sixth day God created human beings, who experience, know and measure time in the manner described by Augustine in Book XI. From that moment on the human time of mental extension has existed alongside the time of the world.

The first time, that dates from the beginning of the second creation, holds primacy over the second not only chronologically but also, and above all, ontologically. After all, the second time is based on the first and would not be able to exist without it. So the psychologism or idealism of Augustine's doctrine of time is limited, and even subordinate.

Still, there is a reverse hierarchy too, for it is the second time, the time of human consciousness, that is closest to eternity. Here, after all, the ineluctable progress of time is to a certain extent suspended.

²² *Psalms* 115:16 (where the Authorised Version has 'the heaven, even the heavens').

²³ *Conf.* XII.2-3.

²⁴ *Conf.* XII, esp. 9 and 11. There are unmistakeable reminiscences of the Neoplatonic system of hypostases with its origin of time in stages; the angels take the place of the intelligible beings. There is also a certain resemblance to the *Timaeus*. On the somewhat ambiguous position of the angels vis-à-vis time and eternity cf. also *De Civ. Dei*, XII.15.

The flow of time is condensed to a form of durational present. The vanished past, the purely instantaneous now, and the as yet unrealised future are all three converted to modalities of an unfolded, trifurcate, and in a certain sense even stretched present. They exist jointly in that present and have thus acquired characteristics of eternity in return for the loss of some of their temporality. Of course, they have by no means become like that motionless unchangeability, for this mental extension changes and shifts all the time. But that something of the past remains, and that the future is already in a certain sense present, is reminiscent of the eternity in which everything is present at the same time. It is the second time, more than the first, that is an image of eternity. It occupies an intermediate position between the first time and eternity. As the life of the angels is a step towards time by comparison with God's absolute eternity, so is time as a mental extension a step towards eternity by comparison with the first time.

Has this relative loss of temporality also spatialised time? This would seem to be the case to some extent. Augustine already asked himself with some emphasis 'where' time is and 'where' the past and the future are located.²⁵ Although the reply 'in the mind' rules out the initial spatial associations, they return in the picture of mental extension. Such rather spatial words and images contribute to the message that the human mind is not given up to time and that something of the timeless eternity houses in it.

According to Paul Ricoeur, the relatively eternal character of human time in Augustine lies not in the extension of the mind but in its attention for, its orientation towards something: not in the *distentio* but in the *intentio*.²⁶ After all, *distentio* also stands for dispersal and disintegration. There is even an important passage towards the end of Book XI in which Augustine describes the idle distraction in time as *distentio*, while he characterises the beneficial concentration of the self in orientation towards God (here, following the terminology of Plotinus, called the One) as *intentio*:

forgetting the things that are behind and not poured out upon things to come and things transient, but stretching forth to those that are

²⁵ *Conf.* XI.18.23.

²⁶ *Op. cit.*, pp. 41–53 (= *TN*, pp. 22–30).

before (not by dispersal but by concentration of energy) I press towards the prize of the supernal vocation, where I may hear the voice of Thy praise and contemplate Thy delight which neither comes nor passes away.²⁷

This vision and terminology continue to the end of Book XI. There is here (and earlier too)²⁸ yet another echo of Plotinus in the representation that he had given of the origin of time, in which the motionlessness of eternity is contrasted not only with entering into movement but also with division and disintegration.²⁹

That is the weak aspect of the *distentio*, one might say. There is certainly no question here of upgrading it to a genuine form of eternity. It is just that it *has* something of eternity, and that is its strong aspect. It should not be forgotten in this connection that in Augustine's analysis the *distentio* is linked in some way to the *intentio*. Memory, perception and expectation may be components of *distentio*, but they are so as forms of *intentio*, as modalities of present attention. More specifically, it is in and through the *praesens intentio* that the future is transferred to the past.³⁰ They are not independent of one another, and only their combination makes human time possible. Even if the *intentio* has a stronger affinity than the *distentio* with eternity, that in no way impairs the affinity between human time and eternity.

²⁷ *Conf.* XI.29.39. 'Not by dispersal but by concentration of energy' = *non secundum distentionem, sed secundum intentionem*.

²⁸ *Conf.* XI.11.13.

²⁹ See p. 58.

³⁰ *Conf.* XI.27.36.

CHAPTER SEVEN

RETROSPECT AND PROGRESS

Before moving on to the Middle Ages, it may be useful to review the story so far by offering a brief summary of the preceding chapters on classical antiquity. As we have seen, the question of the dependence of time on the soul or mind was repeatedly raised by the ancient philosophers, but they conceived and discussed this dependence in a variety of ways.

The most pronounced form was that of total dependence, as defended by Plotinus and later Neoplatonists. After all, they conceived of time as the product of the soul (which is in turn a product of the mind) or as a co-product of the intellect and the soul. Time is thus 'the life of the soul', or it belongs in its static form to the intellectual mind and in its changeable form to the soul. In both cases the senses only come into contact with time via the soul.

Because these thinkers hold the mind and the soul to be eternal, they see a strong link between time and eternity. Although the soul is distributed among innumerable living beings, it is from its undivided state that it produces time. Individual souls therefore play no part in this. From this viewpoint, the elementary individual consciousness is of course not involved in the creation of time at all.

The characterisation of time (at least of ordered or rational time) as a moving image of static eternity derives from Plato. That time, he believed, emerged with the motions of the heavens and was a product of the activity of the demiurge, the divine architect. We still feel that, in the revolutions of the firmament, mutability is connected with immutability, and coming into being and disappearing with permanence. A certain correspondence with eternity still comes to our minds. Plato's view is surprising but not far-fetched. Still, the correspondence of time to eternity as that of image to model no longer played a role for the Neoplatonists. Perhaps they found this basis too weak. Instead, they derived time directly from the eternal soul and the eternal mind. It was there, they claimed, that time was to be found, not in the heavens; at most, the celestial motions revealed time. This gave the affinity between time and eternity a stronger

foundation than that of an image. The result was that the dependence of time on the eternity of soul and mind acquired a pre-eminently *ontological* character. After all, soul and mind bring time into being in the full sense of the word; time exists solely by virtue of them.

The other classical forms of the dependence of time on mind share that ontological character to a lesser extent and often do not regard that dependence as total. The closest to that is the view of the Stoics that time, or a certain aspect of time, is a *lekton* or something similar. In that case, time would be entirely a product of the rational mind and would owe its existence to that mind. However, the Stoics held that existence itself to be incomplete, and thus not to be an existence in the full sense of the word. The Aristotelian Alexander of Aphrodisias imposed yet other constraints. He stressed perhaps more than other Aristotelians that the mind is involved in the genesis of time, but here too this was only true of certain aspects of time.

Aristotle himself propounded an essentially different form of dependence that can be categorised as *constructive*. Although according to the passage at the end of the fourth book of the *Physics* there can be no time without the rational mind, that mind is only required to measure something that in other respects has full existence independently of the mind. Aristotle argued that, if the mind did not determine this measure (the measure of change in relation to prior and posterior), the measure itself would not exist. This measure, or that number, is time, and hence time cannot exist independently of mind. Given all this, the role of mind here is hardly an ontological one. Besides, the dependence of time on mind is partial at most, all the more so in that all this concerns duration alone. Temporal succession in particular seems not to fall under the control of the rational mind and of the soul in general.

The Atomists, especially Epicurus and his followers, appear to have entertained a similar view. For them too, the dependence at issue is constructive rather than ontological, and partial rather than total. As we have seen, however, it is uncertain whether they had very precise ideas on this question, and if so, what they were.

For Augustine the dependence of time on the soul has yet another character: it is primarily a *cognitive* dependence. After all, it concerns our knowledge of time, more especially our capacity to experience, compare and measure temporal duration. That is the perspective from which he argues for the dependence of time on our soul. Now it is unquestionably *our* soul, for that dependence is focused on the

individual human consciousness. Still, it is therefore limited to *our* time, time as we experience, know and measure it. It is often forgotten—indeed, Augustine seems at times to have forgotten it himself—that in addition to that, or rather on top of that, there is the world time: the time that God created along with the world, with which human time (time as experienced by humans, by each individual person) is connected in a complex and mysterious way. Of course, in the case of the overarching world time, there is no question of any dependence on the human or any other mind, except that of God himself. For Augustine, though for other reasons, as for Aristotle, the Stoics and the Epicureans, the dependence of time on the soul or mind was only partial.

The medieval philosophers and theologians were strongly influenced by the philosophy and theology of antiquity. They discussed, interpreted and elaborated the ancient texts. They looked into the past and went further. The classical notions of time, including the points of view regarding the relation between time and mind, also recurred in an adapted and modified form in the Middle Ages. But the transmission of the classical heritage was an extremely complex process. There was no question of its being taken over and assimilated en bloc by the medieval philosophers and theologians.¹

First, there was a much closer affinity with Greek and Greek-speaking antiquity in Byzantium than there was in Western Europe, so the ideas of Plato, Aristotle and Plotinus were upheld more strongly in the East than in the West, a phenomenon that was reflected as far away as Persia and Egypt. As a result, once the Islamic cultural region had emerged, it was way ahead on this score. In the West the rupture with Greek was almost total. On the other hand, the West held an advantage with regard to the Latin tradition. Even though this tradition was incomplete in several respects, there were plenty of points of contact. The work of Augustine was known in principle, Boethius was an important link in the field of philosophy, and the presence of Seneca ensured a measure of continuity of Stoic ideas.

Knowledge of Plato in the West was confined to the Latin trans-

¹ For several basic facts see L.M. de Rijk, *La Philosophie au Moyen Age*, chapters 3 and 4.

lation of the *Timaeus* by Chalcidius. This was the only work of Plato that was available to Western scholars until the twelfth century, and to make matters worse a part of that translation was no longer extant. As for Aristotle, in the early Middle Ages only a few of the texts on logic were known, thanks to the translations and commentaries of Boethius. For the rest, a large proportion of Boethius' translations of Aristotle was lost until its rediscovery in the middle of the twelfth century. Thanks to John Scotus Eriugena, the tradition of Neoplatonism was preserved relatively intact by comparison with those of Plato and Aristotle. In 860 Eriugena was commissioned by Charles the Bald of France to translate texts by pseudo-Dionysius and others; he was so taken by the ideas of the Neoplatonists that he tried to combine them with Christian doctrine. Of course, the knowledge of Neoplatonism acquired in this way contributed to some extent to that of Platonism itself.

In the world of Islam the works of these authors were present to a much larger degree for a long time. From 700 on, Islamic scholars made invaluable contributions to the preservation and absorption of the ideas of Plato, Aristotle, Plotinus and other major thinkers who had written in Greek. They translated them from Greek or Syrian into Arabic, and made use of them in their own works. The tables were not turned until around 1150, when a translation explosion got under way in the West that led to numerous Latin versions of Greek and Arabic philosophical and scientific texts. More particularly, works of Plato and Aristotle that had been inaccessible until then became available. The *Physics*, for instance, was first translated by James of Venice in the second quarter of the twelfth century. A little more than a century later this translation was revised by William of Moerbeke, and in the intervening years at least three other translations had appeared, two of them from the Arabic.² Many works by Alfarabi, Avicenna and other Islamic philosophers were also translated into Latin. This all had a profound effect on Western thought, not least on notions of time.

The first key figure in the development of the post-classical philosophy of time was the Persian philosopher and scholar Avicenna, who worked during the early years of the eleventh century. His

² See B.G. Dod, 'Aristoteles Latinus' in Kretzmann (ed.), *The Cambridge History of Later Medieval Philosophy*.

philosophy was strongly influenced by those of Aristotle and the Neoplatonists. This can already be seen from his notion that the world was created (in accordance with the Koran), but without a beginning in time. This intriguing point of view, this combination of creation and temporal infinity, was to recur frequently in the later Middle Ages. Philo had already raised the issue, but he had probably concluded that the creation of the world took place in time.³ That was also Augustine's view of the matter. The letter of the Bible prevailed over philosophical doctrine among them and their supporters.

As a great admirer of Aristotle (whose *Metaphysics* he claimed to have read forty times in his youth before he had learnt to understand it with the help of Alfarabi's commentary), Avicenna could hardly assume that time, change and motion had a beginning. On the other hand, his view that God created the world from his goodness, indeed, that the creator of the world is pure goodness, recalls Neoplatonism. On the whole, his description of the origin of the world is a mixture of Aristotelian and Neoplatonist elements: he provides a strikingly emanationist account, but one that is grafted onto an Aristotelian conception of the cosmos. Only the intelligence of the first sphere is created; the intelligences of the other spheres emanate from this, and eventually the material, sublunary and transitory things emanate from the tenth and last intelligence. God himself is eternal in the sense of timeless, and so are the intelligences. The changeable world, on the other hand, is eternal in the sense of proceeding in time without beginning or end.⁴

Avicenna stresses that only what is capable of change is subject to time; there can be no prior or posterior apart from that. In fact, he argues that time in essence measures precisely this fundamental changeability, by virtue of which it is not itself subject to actual change but accompanies events, whatever they may be. All the same, the *measure* of time is subject to a certain change, since time cannot be measured without appealing to an actual change. For Avicenna that is the motion of the prime mover, the sphere of the fixed stars, the condition—as it was for Aristotle—of all other motion. The uniqueness of the measure of time is taken to derive exclusively from that movement.⁵ In another context Avicenna even remarked that

³ See above, pp. 53–54.

⁴ On this cf. G. Verbeke, *Avicenna, Grundleger einer neuen Metaphysik*, pp. 16–26.

⁵ Cf. A. Mansion, 'La théorie aristotélicienne du temps chez les péripatéticiens

the distinction between prior and posterior only exists by virtue of the intellect. This statement is difficult to reconcile with the main thrust of his notion of time, and it is unclear how it should be situated within that theory. Nevertheless, it had consequences in later centuries.⁶

Unlike Avicenna, Aristotle had not concerned himself very much with the uniqueness of the measure of time. It was an obvious problem, and Aristotle had drawn attention to it: if time is the measure of motion in relation to prior and posterior, does not perhaps each movement have its own time? He had also given an answer, one which appealed to the uniqueness of the number by which time is measured. However, this seems to be at odds with his repeatedly expressed idea that time is not the number with which we count, but the number that is counted. He only appealed to the celestial firmament in the second instance, and then above all as a means of specifying in more detail the time whose uniqueness was already guaranteed. The problem was taken much more seriously by Avicenna and by most of his followers.

The issue was raised again some 150 years later by Averroës, the great commentator on Aristotle whose influence was to last for centuries. Grosso modo he adopted Avicenna's solution. From then on an appeal to the prime mover or the prime motion (*primum mobile* or *motus primus*) came to occupy a central position in the justification of the unity of time in the medieval philosophy of time.⁷ This appeal could take one of a variety of forms. It is immediately surprising to see that Averroës added a nuance to the original claim by connecting it with what can be called an anthropological or even psychological point of view. While Avicenna had related time primarily to the essential changeability and mutability of things, Averroës focused on the continuous changeability of ourselves, that is, the human perceiver and his mind and consciousness. We perceive time directly and essentially in ourselves, not only in our actual changes but also

médiévaux', pp. 290–292; and Anneliese Maier, 'Scholastische Diskussionen über die Wesensbestimmung der Zeit', p. 522.

⁶ Cf. U.R. Jeck, *Aristoteles contra Augustinum*, pp. 103–113.

⁷ Cf. Anneliese Maier, *op. cit.*, pp. 522–524, 538ff. This article also discusses various other explanations. That of Roger Bacon is the most reminiscent of Aristotle. The account offered by Peter Olivi (cf. Maier, pp. 532–538) is discussed in the following chapter; see pp. 98–99.

in our capacity for change. Ultimately, then, familiarity with continuous time is based on familiarity with our own continuous quality. If we experience time in a different way, it is indirect and fortuitous instead of direct and essential. In such a case we experience time in connection with some event or other, but we only do so via our inner experience. That even applies to the diurnal rotation of the outermost celestial sphere. We only fully perceive the time contained in it through our own inner changeability, which, by the way, like all changeability, is brought about by this rotation.⁸

The importance that Averroës attaches to our own nature, and more particularly to the quality of our mind, is strongly reminiscent of the view of Augustine. For both thinkers, we only know time by virtue of a specific mental property (extension for Augustine, changeability for Averroës), and in both cases this property plays a role in the explanation of what time really is. Unlike Augustine, however, Averroës does not lose sight of the connection with the external world and with the origin of time. The very first rotation remains for him the secure foundation of the objective unity of time. And when he comments on the time-and-mind passage in Aristotle's *Physics*, he minimalises the contribution of the mind. For him, time as the measure of motion exists *potentially* outside the soul; the soul measures the succession that can be measured in the movement, and thereby makes time *actual*.

With regard to the question of the age of the world and of time, Averroës concurred once again with Avicenna in stating that the world did not originate in time. The problem that they both shared—the relation between the act of creation attributed to God and the classical philosophical legacy, particularly that of Aristotle—resurfaced soon afterwards in intensified form in the writings of the Jewish thinker Maimonides, and later on, of course, it was to intrigue the Christian scholastic thinkers. The conflict between the biblical account of the creation and Aristotle's claim that motion and change cannot have a beginning or an end and must therefore be infinite had to be resolved in some way or other once all of Aristotle's major works became available in Latin translation around 1200.

⁸ Cf. A. Mansion, op. cit., pp. 282–283, 286 and 292; Maier, op. cit., pp. 522–523. Apparently Duns Scotus attributed this notion to Avicenna too; cf. Bernard Landry, *Duns Scot*, p. 126.

Not everyone accepted that the bible unambiguously stated that the world had originated in time. The Gnostics and a few Neoplatonists took a different view, but it remained confined to a minority and they were subsequently regarded as heretics. In the light of the text, it is perfectly understandable that the orthodox interpretation of the story of *Genesis* indicated a point of commencement in time.⁹ This could be found in Augustine and other Fathers of the Church, and in the sixth century the Neoplatonist Christian philosopher Philoponus had also argued that the world had commenced in time within the framework of his systematic critique of Aristotelian physics and cosmology. Later the orthodox view was enshrined in important theological pronouncements. The Fourth Lateran Council (1215) adopted this view, which was also to be found in several other doctrinal pronouncements in the thirteenth century, first in 1210, later in 1270, and in particular in 1277.¹⁰ Mentalist doctrines of time such as that of Augustine were also condemned on the latter occasion.

Shortly before, Moses Maimonides (born around 1135 in Córdoba, he migrated to Egypt, where he became court physician) went into the question in detail in the second part of his *Guide of the Perplexed*. He argued that philosophy does not—indeed, can not—resolve the matter. Even Aristotle, the prince of philosophers, had failed to come up with a proof that the world and time had no beginning; he had merely offered plausible arguments, a fact of which he was well aware, according to Maimonides. What Aristotle had to say about the sublunary world, Maimonides claimed, warranted unconditional support, but all the rest was largely speculation. For Maimonides, whether the world had had a commencement in time was an open question.

Believers were thus free to take the biblical account literally. This was all the more valuable in that the creation of the world *ex nihilo* in the beginning of time is the greatest of all wonders. As such, it sanctions all other wonders, and for that reason alone it is of fundamental importance for the divine law. To the dismay of many of his fellow believers, however, and perhaps to the confusion of the

⁹ Cf. Sorabji, *Time, Creation and the Continuum*, pp. 194–197.

¹⁰ For some sceptical comments on this see Cyril Vollet in Thomas, Siger, Bonaventura, *On the Eternity of the World*, pp. 3–4. The edict of the Fourth Lateran Council was repeated by the First Vatican Council of 1870.

perplexed, Maimonides remarked that, if it had been possible to demonstrate philosophically that the world had not had a beginning, it would have been simple for him to interpret the divine act of creation described in *Genesis* metaphorically.¹¹ Maimonides probably did not accept Aristotle's conclusion that there can be no time without mind either, for when he lists the theses that he takes to have been proven by Aristotle and his followers, he asserts in one of them that motion and time are indissolubly connected. More particularly, time is a necessary consequence of movement. This seems to imply that time is dependent on motion and nothing else.¹²

A few prominent Christian thinkers held the capacity of human reason to explain the problem of the origin of the world in higher esteem. They claimed that it was possible to demonstrate by reason that the world must have had a beginning in time, at least after this was already known thanks to divine revelation. Anselm (1033–1109) had already expressed a view along these lines. Almost two centuries later, Bonaventura was the best-known and most ardent defender of the point of view that the creation of the world in time could be demonstrated rationally. He combined this with sharp criticism of the whole philosophy of Aristotle in favour of Plato's doctrine of Forms.

The medieval philosophy of time reached its acme in the middle of the thirteenth century. This was to last until the middle of the following century. Its main founders were Albertus Magnus and his pupil Thomas Aquinas.

Albertus' oeuvre is voluminous and wide-ranging; he was a genuine polymath. We are here concerned with his philosophy of nature, and above all with his commentary on Aristotle's *Physics*. This commentary was written perhaps shortly before 1250. At that moment the teaching of Aristotle's works on natural philosophy was banned in the Sorbonne, but this ban did not apply to the other French university, that of Toulouse. The latter university even prided itself on this teaching in an extant circular (though one that was probably

¹¹ Moses Maimonides, *The Guide of the Perplexed*, Part II, chs 13–31, esp. pp. 289–294, 319–320 and 327–330. Cf. Ze'ev Levy, *Probleme moderner jüdischer Hermeneutik und Ethik*, pp. 16–17.

¹² *Ibid.*, Part II, Introduction, premise no. 15; cf. II.14.

never sent). Since 1231 the ban had no longer been unconditional anyway, and besides that there is reason to suppose that it was sometimes taken lightly. At least, Roger Bacon may have written his two commentaries on the *Physics* in the 1240s, and they were the product of his teaching in Paris. The big breakthrough was in 1255, when teaching Aristotle's *Physics* was officially allowed in the Sorbonne and was even made compulsory in the faculty of arts. In Oxford the first commentaries on the *Physics* appeared at the same time, including that by Robert Grosseteste.¹³

Albertus' commentary is not very strict. He follows Aristotle's argument, but with a large measure of freedom. He turned his presentation of Aristotle's work into a treatise of his own. His conclusions in the section on time are close to those of Averroës, but he also responds to Avicenna and a number of other classical and medieval thinkers. He was the great compiler who had a voice of his own too.

Like Avicenna and Averroës, Albertus sees the rotation of the outermost firmament as determining the uniqueness of time and the corresponding measure. He accentuates this, but in a different way from Averroës. According to Albertus, what Aristotle says about time and motion in general, namely that we measure the one with the other and the other with the one, only applies to that first motion. This determines time, while we are also able to measure it with time. So time is related to this movement in two ways: as an accident to its subject, and as a measure to what is measured or counted (*sicut ad subiectum et numeratum*). This does not apply to any other movements, where the relation is a single one (*sicut ad numerata solum*). They are only measured with time, which we have at our disposal thanks to the rotation of the stars.¹⁴

In addition, the peculiar feature of Albertus' doctrine of time lies in his ideas about the Now. For him, the Now is the ultimate cause

¹³ For these and several other facts see the dissertation by J.M.M.H. Thijssen, *Johannes Buridanus over het oneindige*, Part 1, ch. 1, esp. pp. 17–56; the circular from Toulouse on pp. 24 and 28. See also Michael Haren, *Medieval Thought*, chs. 5 and 6.

¹⁴ *Refertur enim tempus ad primum mobile et ad motum eius sicut ad subiectum et numeratum, ad alios autem motus sicut numerus extrinsecus ad numerata solum et in illis non est sicut in subiecto: et ideo non multiplicatur multiplicatione eorum.* In *Physica*, lib. IV, tract. 3, exp. 17 (341b–342a). Cf. A Mansion, op. cit., pp. 295–296 and Anneliese Maier, op. cit., p. 522.

of time. To start with, it is the basis of the omnipresence of time, and in its continuous plurality it is also the foundation of the progression of time. Albertus saw a certain proportionality between the relation of the Now to time, on the one hand, and the relation of a moving object to its motion, on the other. Aristotle had already stated that, but Albertus emphasised and elaborated it. That is the way he described how, in the prior and the posterior, the Now becomes the flow of time. For the human observer, however, the Now is also the break in the continuity of time. Compared with Averroës, then, the tension between time outside us and time inside us has shifted. It no longer concerns the continuous flow of time itself (whereby we only know external time by virtue of our own inner changeability), but it applies to the even flow of time together with its continuous interruption, for the continuous interruption only takes place in the mind; without the mind there is pure continuity.

This is in turn connected with the fact that Albertus is opposed to any mentalist account of the progression of time. He presents the arguments for and against the mental character of time (seven pro, five contra), and finally adopts a non-mentalist view. Of course, he recognises that counting and measuring take place in the mind, but that is as far as he is prepared to go. As a number or quantity, the object of that operation is situated in the external world, and is thus independent of mind. The mind counts or measures something external that is countable and measurable in reality. Albertus does not even doubt the objective existence of past and future, connected as they are with the indivisible but real, forward-moving Now. This is in no way affected by the fact that for him the Now has an aspect that is indissolubly linked with the human mind.¹⁵

Unlike Avicenna and Averroës, Albertus considered the creation of a world without a beginning in time to be impossible. What has been created must have a beginning in time, but rational thought cannot decide whether the world was really created or not; it can make this probable at most. Only divine revelation can provide us with certainty. Albertus did make a subtle attempt to salvage Aristotle's claim that time and motion are eternal; in fact, to a certain extent he adopted Aristotle's conclusion. However, this would only apply

¹⁵ Cf. John Quinn, 'The Concept of Time in Albert the Great', pp. 32–41; Anneliese Maier, 'Die Subjektivierung der Zeit', pp. 369–370.

within the causality of nature; it does not apply, of course, to the divine causality of the *creatio ex nihilo*.¹⁶

Thomas Aquinas adopted a diametrically opposite view on the contribution of reason and revelation in this question. According to him, it can be rationally demonstrated that the world was created by God, but not that the creation took place at the beginning of time. Rationally and philosophically speaking, the created world could exist without either a beginning or an end in time. For Thomas it is precisely the limitation in time that is disclosed to us through the revelation; God could have made the world eternal.

He discussed the issue on several occasions, for instance in some of his major works, namely *Summa contra Gentiles* and *Summa Theologiae*. Moreover, around 1270 he devoted a separate treatise to it with a title that was also used by other writers: *De Aeternitate Mundi*, in which he argued that the cause or maker of something need not precede the effect or result. The order can be a natural instead of a chronological one. Likewise, a product can be made without a period in which it did not exist preceding the period in which it did exist. So the *creatio ex nihilo* does not necessarily imply a sequence of nothing followed by something. What matters is that there is nothing from which the product was created, and that what is created is thus solely dependent on the act of creation itself.

This is intended as a defence of the possibility that a created world is infinitely old, but strictly speaking the argument can be applied equally to a finite time that commences at the same time as the creation. After all, in the latter case too, the creation is not preceded by any period of time. However, Thomas discussed the question of the possibility of an infinite duration of the world differently too. He did so by countering the main philosophical counter-argument: the argument that a world without a temporal beginning is impossible because it demands the existence of something that is actually infinite in the form of an infinite, complete series of successive days or events, and even of an infinite collection of immortal and therefore simultaneously existing human souls. The latter is invalid, according to

¹⁶ Cf. Helen S. Lang, *Aristotle's 'Physics' and Its Medieval Varieties*, ch. 6, esp. pp. 132–134. Strictly speaking, Albertus adopted different positions on different occasions. For several refinements, see Richard C. Dales, *Medieval Discussions of the Eternity of the World*, esp. pp. 76–77, 157, 254 and 258.

Thomas, for God could have created mankind a finite time ago if he had so desired. As far as the rest is concerned, he remarks that it is by no means proven that God would be incapable of producing something actually infinite.¹⁷

The whole treatise was fairly polemical and it later received the subtitle *Contra murmurantes*, the grumblers being those who clung to the rational demonstrability of the beginning of the world and generally sought their inspiration in Augustine and not, of course, in Aristotle. Their view, with Bonaventura as their main spokesman, had been the dominant one until now. After Thomas it soon became the conservative view.¹⁸

Siger of Brabant followed the new course the furthest. He represented the other extreme to Bonaventura and his supporters in his respect for Aristotle's reasonings. According to Siger, it was not necessary to try to reconcile philosophical points of view with the revelation under all conditions. The philosophy of nature, even in its most convincing form, might well be incompatible with the divine revelation. Aristotle should be presented honestly and in full. Siger accepted the lack of a beginning for the world as a rational conclusion along with the religious truth of the story of the creation. Although he considered insights based on divine revelation to be more certain than conclusions based on experience, and repeatedly stated that when they were in conflict the religious truth should be adopted, it was a risky standpoint. It was close to the doctrine of double truth, called Averroism at the time. According to that doctrine, rational truths have an independent value independently of the revelation; they can be incompatible with it and are not refuted by it. That doctrine was under suspicion, not least through the interventions of Bonaventura, and was repeatedly condemned.¹⁹ Nevertheless, even Bonaventura recognised that Aristotle, speaking as a natural philosopher, could not have arrived at any other conclusion than that the world was created without a beginning.²⁰ This seems

¹⁷ Thomas, Siger, Bonaventura, op. cit., pp. 19–25.

¹⁸ In addition to Anselm and Bonaventura, William of Auvergne, Alexander of Hales, Robert Grosseteste and Roger Bacon also supported the old view. Cf. *ibid.*, esp. pp. 6 and 17. For more details and commentary see Dales, op. cit. and Wissink (ed.), *The Eternity of the World*.

¹⁹ Siger's views were repeatedly condemned by the clerical authorities, but it seems unlikely that Siger was ever condemned as a heretic.

²⁰ Thomas et al., op. cit., p. 116.

to imply an exoneration of those who came after Aristotle too, which in turn shows that major disputes about dogma could suddenly shrink to no more than differences of emphasis.

In his commentary on Aristotle's *Physics*, Thomas regularly followed his mentor Albertus, and like Albertus was often in agreement with Averroës. Still, it is noteworthy, as A. Mansion has pointed out, that in his later works Thomas no longer mentions Albertus' view of the double relation between time and the prime motion, not even in those passages where he discusses the unity of time with an appeal to the prime motion and where such a reference might thus be expected. This must mean that for Thomas the connection between time and the prime motion had become looser.²¹

Two more of Thomas' contributions deserve special mention. The first is his discussion of a possible time preceding the creation. Thomas recognised that there is no time without change, without a changeable world. That is why there is no temporal succession prior to the creation. But, following Aristotle, he also recognised that we necessarily relate every moment in time to a 'before' and an 'after'. That is equally true of the very first moment of the creation. We imagine something prior and speak as if it really existed, even if only by saying that there was no time before the creation. In the same tenor, he describes the notion of a beginning of the world and of time as the notion that time has not always existed. This makes it clear that what supposedly precedes the beginning does not form a part of real time. It only exists in our imagination. At the most, it is imaginary time.²²

'At the most' refers here not just to the nature of the time at issue, but also to Thomas' supposed intentions. The term 'imaginary time', or even 'imagined time', may already go further than what Thomas had in mind, so that it would be more correct to use the expression 'imagining of time'.²³ In connection with what was said above about his treatise *De Aeternitate Mundi*, the stronger formulation is in order here, since it makes clear that Thomas is alluding

²¹ A. Mansion, op. cit., pp. 304–306. Anneliese Maier concurred with this observation in her 'Scholastische Diskussionen', p. 524, n. 6, but her use of the term 'doppelte Beziehung' is somewhat different.

²² Thomas, *Commentary on Aristotle's 'Physics'*, Book VIII, section 990.

²³ Cf. Van Fraassen, *An Introduction to the Philosophy of Time and Space*, pp. 19–20 and 203.

to something that might precede a creation with a commencement of time (but not a creation without a commencement of time). Other passages in his work, however, display a more cautious tone. According to the interpretation they entail of possible references to circumstances before the creation and before the commencement of time, the temporal expressions used here can only have a negative meaning and thus do not even refer to an imagined, imaginary time. The content of the claims at issue, namely that nothing of a temporal nature precedes the creation, would destroy, as it were, the field of application of the word 'precede'. We find here a certain similarity to what a twentieth-century analysis à la Russell would amount to. It is true that such a modern analysis would put it in a different way: it would not be the change in the meaning of the word that counts, but only the underlying logical form of the statements and their content (which is partly determined by that logical form). But on that score the result would be the same. In both cases the statements under scrutiny are considered to be bare denials of 'There is something that precedes the creation', thus as: 'It is not the case that something precedes the creation'.

In so far as one can speak of an imaginary time-that-is-no-time, it is, of course, dependent on the mind or soul of those who imagine it. The question of dependence, if any, of real time is more complicated, even if one tries to fall in line as far as possible with the claims and intentions of Aristotle, which is what Thomas is doing in his commentary on the *Physics*. His comments on the time-and-mind passage constitute the second of his contributions worthy of special mention.

Thomas reacts precisely and in detail to what Aristotle had argued. After presenting a summary, he weighs up the pros and cons. To start with, he considers that counting or measuring are activities that depend on the rational part of the soul. However, that is not true of the numbers themselves, nor of the object that is counted or measured. Thomas is still prepared to admit that if there cannot be any counting or measuring instance, nothing can exist that is countable or measurable. Vice versa, the possibility of existence, and a fortiori the actual existence, of what can be counted implies the possibility of a counting instance, just as the (possibility of) existence of something perceptible implies the possibility of a perceiver. But naturally the actual existence of something that can be counted does not imply the actual existence of a counter. Likewise, the non-existence of a

counter in no way implies the non-existence of all that is countable. And thus, more particularly, countable time can exist without the existence of the mind.²⁴

Thomas presents the case as if Aristotle had intended it to be taken like that. Apparently he considered that in this passage Aristotle presents and discusses the argumentation for the thesis that nothing countable can exist independently of the mind or soul, but rejects it in the end. That is probably a misinterpretation. Thomas' exposition is of an exemplary clarity, but although inspired by Aristotle from beginning to end, it is an exposition not of Aristotle's views, but of the problem with his own conclusion.

For Thomas the essential link between time and mind is situated somewhere very different from where Aristotle located it, for although something countable can exist independently of a counter, time as the numerable aspect of motion in relation to prior and posterior presupposes the soul. That is not because of its numerability, but because of motion, since Thomas holds that motion is not entirely anchored in things and given with them, but presupposes a mind that can compare an earlier state with a later one. All that exists independently of the mind is the indivisible part of the motion, that is the momentary situation, which in turn corresponds to the Now of time. Therefore, without the mind, motion, and thus time, can only have an incomplete or rudimentary existence. Aristotle had made the latter claim too, but for different reasons. While for Aristotle it is the measure, for Thomas it is the continuous progression that is dependent on the mind.²⁵

²⁴ Thomas, *Commentary on Aristotle's 'Physics'*, Book IV, Lecture 23, sections 627–629.

²⁵ *Ibid.*, Book IV, section 629.

CHAPTER EIGHT

UTRUM TEMPUS POSSIT ESSE SINE ANIMA: DEBATES AROUND 1300

The problem of whether ‘time can exist without mind’ was brought into the world by Aristotle. He had raised the question without providing a convincing answer. Augustine had made the problem more urgent because of its central position in his doctrine of time, but he failed to deliver a decisive answer either. The question continued to fascinate medieval philosophers of nature after Albertus Magnus and Thomas Aquinas: many discussed whether time exists independently of or outside the mind (*utrum tempus possit esse sine anima, utrum tempus sit aliquid praeter animam, utrum tempus habeat esse extra animam, utrum tempus sit quid reale extra animam*, and so on). This debate often took the form of a special *quaestio*, which might or might not be a part of a larger work, such as a commentary on Aristotle’s *Physics* or the *Sententiae* of Peter Lombard.¹ In addition, separate disputations or treatises were devoted to the matter. Especially during the last quarter of the thirteenth and the first half of the fourteenth century, it was the object of passionate debate on the part of the scholastic philosophers. It was a matter of importance, with repercussions for theology, metaphysics and natural science, and there was room for divergent solutions. That room was not so much a matter of ‘yes’ or ‘no’, but concerned above all aspect and degree. Very different points of view were advanced, from an extreme realism to a remarkable subjectivism, with a wide range of intermediate positions.²

¹ For a brief discussion of the genre of the *quaestio* and other forms of commentary, see J.M.M.H. Thijssen, *Johannes Buridanus over het oneindige*, Part 1, pp. 50–56. Cf. *Encyclopedia of the Middle Ages*, ed. Andre Vauchez, s.v. “Quaestio”.

² For the following I have drawn on the articles by Anneliese Maier, ‘Die Subjektivierung der Zeit in der scholastischen Philosophie’ and ‘Scholastisches Diskussionen über die Wesenbestimmung der Zeit’. Both articles contain lucid summaries and analyses as well as many quotations from the relevant medieval texts. For the influence of Augustine’s doctrine of time in confrontation with those of Aristotle and Averroës, see Kurt Flasch, *Was ist Zeit?*, pp. 160–195, and especially Udo R. Jeck, *Aristoteles contra Augustinum*. The latter contains extensive summaries of

The most radical position, namely that time is wholly bound up with the soul and exists only in the soul, found few supporters. The consequence that change and motion too would therefore only exist in the soul was generally felt to be a *reductio ad absurdum* of this position. Augustine's characterisation of time as an extension of mind failed to gain favour, although some thinkers, including Averroës, did express comments pointing in this direction and an echo of it could even be found in Thomas Aquinas. On the other hand, the conviction that the being of mutable things, including motion and time itself (the *esse successivum*) differs in essence from the being of unchanging things (the *esse permanens*) was widespread. But although this essential difference was taken to be one of quality, with the *successiva* partaking of a lesser grade of being, a radical denial of the extra-mental reality of time, change and motion went too far for the participants in the debate. Rather needlessly, this view was condemned in the famous pronouncement of 1277. Although this pronouncement was generally directed against views held by Aristotle and Averroës, and some supporters of Augustine were even prominently involved in drawing it up, at least one of the 219 theses condemned by Etienne Tempier, bishop of Paris, was one shared by Augustine: the eighty-sixth of these condemned theses was the claim that time, as well as the everlasting duration of the angels, only exists in the mind.³

So everybody gave a more or less affirmative reply to the question of whether time can exist outside the soul. Almost always, however, important restrictions were attached to that answer, and there was often little difference between a 'yes, but' and a 'no, not entirely'.

Albertus Magnus had based the reality of time outside the mind primarily on the reality of the Now, of the moment, which entailed the reality of the related division of time into past and future. In this way, the reality of temporal succession was implied in the reality of the successive moments. Aristotle had made a remark that

the many thirteenth-century treatises on time. A large amount of information was already contained in the series of articles by Pierre Duhem under the title 'Le temps et le mouvement selon les scolastiques' from 1913 and 1914. Cf. Duhem, *Le système du monde*, vol. VII, ch. 4.

³ The thesis ran literally: *quod aevum et tempus nihil sunt in re, sed solum in apprehensione*. In the rearranged modern editions this thesis has become the two-hundredth; see Piché, *La Comdamnation Parisienne de 1277*, p. 40. For commentary see Jeck, *op. cit.*, pp. 329–338, and Haren, *Medieval Thought*, pp. 204–211.

could be used as a premise for this point of view. It stood in a conspicuous place at the start of Chapter 13 of Book IV of the *Physics*, where Aristotle says that the Now not only separates past and future but also connects them to form a whole.⁴

Henry of Ghent became the most important representative of this point of view when in 1279 he dealt with the problem as a *quaestio*: *Utrum tempus possit esse sine anima*. His discussion formed the basis of later elaborations. He goes in detail into Augustine's argumentation and conclusion that time only exists in the soul (Augustine's reference to the world time created by God and independent of mankind met with remarkably little support in the Middle Ages), and he systematically compares Augustine's view with Aristotle's comments on time and mind. This was novel, and an indication that Augustine's point of view had certainly not become irrelevant after 1277. However, Henry argued, Augustine could not possibly be right, for in that case motion would not exist outside the soul either, while experience incontrovertibly shows the opposite to be the case. His major error had been to focus on the division of the past and the future by the present, and not on their connection by and in that same present. As separate components they certainly do exist only in the mind, but their connection takes place in the present where they meet one another, as it were. Although time exists as a continuum in nature by virtue of the Now, it exists as a discretum only by virtue of the soul. And since time, according to Henry of Ghent, is a synthesis of continuity and discreteness, it exists partly in things and partly in the soul (*partim in rebus, partim in anima*).⁵

Not everybody was satisfied with this conclusion. Some felt that it did not go far enough. Dietrich of Freiberg argued that time as a continuum is still dependent on the soul, and his conclusion was closer to that of Augustine. But he did not situate time entirely in the soul either; he was influenced not only by Augustine but also by Aristotle and Averroës, and he accepted a certain potential presence of time in the external world.⁶ According to others, Henry of

⁴ *Physics*, 222a10–19; cf. 220a4.

⁵ See the very comprehensive discussion of the treatise of Henry of Ghent by Udo Reinhold Jeck, op. cit., pp. 339–398; the text of the treatise is reproduced there on pp. 463–476. Cf. further Kurt Flasch, op. cit., pp. 176–185, and Anneliese Maier, 'Die Subjektivierung der Zeit', pp. 365–366. It is possible that the treatise was already presented in 1278.

⁶ For the ideas of Dietrich of Freiberg see Jeck, op. cit., pp. 429–444 and Kurt

Ghent's conclusion went too far. In particular, in the 1280s Peter John Olivi combatted Augustine's doctrine of time more vigorously than Henry had done, without even conceding a partial truth to it.⁷ Moreover, in Henry of Ghent's writings it was unclear exactly where the transition from a qualitative to a quantitative time was to be situated. Is time as measure of motion a prerogative of the soul? That met with opposition. A few decades later, Baconthorp tried to resolve this difficulty by continuing Aristotle's reasoning further. Not only does the Now connect past and future, but it actually contains them and thereby makes them measurable. Remarkably enough, this bold development of an idea of Aristotle's (though disregarding the central time-and-mind passage itself) also contains a fairly bold development of an idea of Augustine's. After all, it looks as though his conception of the triple nature of the present as the basis for the measurability of time was adopted by John Baconthorp, although the latter goes completely against Augustine in situating it outside the soul. A similar point of view was defended around 1325 by Johannes Canonicus (John the Canon).⁸

Albertus and Thomas, however, had also alluded to a different argument for the reality of time outside the mind. In that connection Thomas had explicitly spoken of a diminished reality of time. Unlike Henry of Ghent, he argued that motion is not anchored in things,⁹ and this view had a direct impact on the problem of the existence of time. According to Thomas, the really existing instant cannot entirely make good the deficit. So Thomas parts company with Albertus: the continuous flow of time is situated solely in the mind.

The new argument, to which they both referred and that was to be further elaborated by their successors, was connected with the distinction between potentiality and actuality. As Averroës had already claimed, time is not fully actual, but is based on a combination of *potentia* and *actus*. Aristotle had drawn attention to the possibility of such combinations in Book IX of his *Metaphysics*, and had based his

Flasch, *op. cit.*, pp. 187–189; cf. also Maier, *op. cit.*, p. 364. Jeck also discusses the views of Meister Eckhart in connection with those of Dietrich, *ibid.*, pp. 445–450.

⁷ Cf. Jeck, *op. cit.*, pp. 399–426.

⁸ Cf. Anneliese Maier, "Die Subjektivierung der Zeit", pp. 367–368.

⁹ See above, p. 91.

definition of change on it in the first chapter of Book III of the *Physics*. According to that definition, change is the actuality of what potentially exists, in so far as it potentially is this actuality.¹⁰ In spite of the opaqueness of this definition, it is evident that for Aristotle actuality and potentiality are intertwined in every process of change. In another passage in the same book he argued that this also applies to the potentially infinite. His medieval followers used this combination of actuality and potentiality to detach the problem of the reality of time from the distinction between soul and external world. The existence of time was thereby guaranteed as partly potential, although this entailed a new ontological problem.

It was above all the Dominicans who were drawn to this solution in terms of a combination of potentiality and actuality (*actus permixtus potentiae*). The key document here is the so-called *Opusculum de tempore*, consisting mainly of a collection of texts and summaries of texts from Albertus and Thomas. It states that the permanent things (*entia permanentia*) have a different kind of existence from changing, successive things (*entia successiva*). There is no question of a pure, unadulterated, full actuality in the case of the latter. The same therefore applies to time, so that time too is taken to have a diminished actuality. In a certain sense that implies a diminished reality too, but this no longer has any connection with dependence on the soul. The objective existence of time independently of the soul is thereby assured.¹¹

The view of Aristotle himself on the dependence of time on the mind was interpreted in a wide variety of ways. The analysis and interpretation of the relevant passage differed from one commentator to another, as was seen in the preceding chapter. Albertus Magnus had offered a realist interpretation around the middle of the thirteenth century. He argued that formal number, including that of change in relation to prior and posterior, exists outside the soul. That is how numerability is determined. Only the actual act of counting itself, the determination of the number in question, calls for an

¹⁰ *Physics*, 201a9–10.

¹¹ For the notion that the existence of time is based on a combination of actuality and potentiality cf. Anneliese Maier, 'Die Subjektivierung der Zeit', pp. 369–374. It also met with the favour of some Franciscans, such as William of Alnwick, a pupil of Duns Scotus.

entity to do the counting. Thomas had formulated that point of view in the keenest way around 1270, though in doing so he did violence to the tenor of the Aristotelian passage. The result was that time as the measure of motion was partly dependent on the soul and partly not. For the time being the latter was the decisive aspect, however, because precisely that which is directly counted or measured is not dependent on the mind in the eyes of these two thinkers.

Their view continued to find support in the following decades. For example, it was adopted in the second decade of the fourteenth century by John Baconthorp. Generally speaking, however, a significant shift took place, sometimes in emphasis and sometimes in essence. This shift was in the direction of a psychological or mentalist view. For many philosophers (the striking exceptions will be discussed later) the soul came to play a larger role in the concept of time.

It started with the idea that even what is outside the soul and embodied in things may still be dependent on the soul in certain respects. This was not to deny that the foundation of time is situated in things, but it was further argued that it found itself there thanks to the soul. This was already true of Dietrich of Freiberg, and it was also argued by Aegidius Romanus (Giles of Rome), who around 1277 drew a parallel with the universals as he conceived them. As the shared nature of the individual things, these universals are 'materially' situated in the things, but formally speaking they are based on an abstraction that can only be carried out by the intellect. The same is true of time: its continuous progression is enshrined in things, but its discrete character, the division into prior and posterior and all that that entails, has to be brought about by the soul. Aegidius described it as the 'formal' processing of a 'material' given. The implication is that time, in so far as it exists outside the soul, is nevertheless dependent on the soul in a certain respect. Here too a form of potentiality and actuality is involved, but this time the emphasis is not on their combination or union but on their separation. As Averroës had already posited, on this view potentiality is inherent in things and actuality is inherent in the soul.

That need not apply to the Now. That could already be seen in the case of Henry of Ghent, whose treatise of 1279 mentioned above corresponded in essentials to the view of Aegidius, but who above all championed the notion that the reality of the continuous progression

of time is based on the reality of the Now. In this he followed Albertus, but unlike Albertus he stressed the role of the soul in other respects. Prior and posterior as discrete elements within the progression of time exist only by virtue of the soul; time, so conceived, exists strictly speaking only *in* the soul.¹²

Duns Scotus appears to have entertained similar ideas, though there is little of them to be found in his extant work. It may be that his view is reflected in a *quaestio* on time in *De rerum principio* (that used to be attributed to him, but was probably written by a fellow Franciscan, the later cardinal Vitalis de Furno). In the course of a discussion of the views advanced by others, it opts for a middle course: *materialiter* time exists in motion external to us, but *formaliter* it exists as the measure of that movement through and in us.¹³ Others are a little more specific. For instance, William of Alnwick says that Duns Scotus explicitly held time as the number of motion to be a *respectus realis*, but claims that it is the product of the capacity and activity of the soul. Alnwick, who himself opposed similar views of Aegidius Romanus and Henry of Ghent, had difficulties with this position. His summary is succinct: ‘The number that is used for the continuous things is thus something real; although it depends on the soul, it is not in the soul but in the external world’.¹⁴ It is a conclusion that, in one form or another, had been drawn earlier and that could be developed in a variety of ways, which is what happened within the Scotist school.¹⁵

At any rate, this contains the germ of a significant limitation on realism. This is primarily because the soul is here characterised as not only an actualising but also a constituting condition. Time can still be regarded as something whose foundation exists outside the soul, but the soul has gradually come to play a major role in its completion or even coming into being. That was already evident in the earlier view of Peter John Olivi, a precursor of the Scotists.

¹² Cf. *ibid.*, pp. 379–381.

¹³ Bernard Landry, *Duns Scot*, pp. 126–127. Cf. Maier, ‘Die Subjektivierung der Zeit’, pp. 366–367 and Flasch, *op. cit.*, pp. 185–187.

¹⁴ *Ergo numerus rebus continuis applicatus est quid reale, licet dependat ab anima, tamen non est in anima sed in re extra.*

¹⁵ Cf. Maier, *ibid.*, pp. 382–386. The view of Duns Scotus that human thought in principle (that is, if the state of sinfulness is suspended) coincides with the thought of God is important in this connection. In that case, humans could have the same relation to time as God.

Although Olivi had attacked the Augustinian doctrine of time and had thereby insisted on the objective reality of time, the situation was different in respect of the uniqueness of time. Like Aegidius, he appealed to the doctrine of universals. He considered that the numerous, in first instance parallel times such that each thing, whether in motion or at rest, has its own time (*tot tempora quot existentiae*), can only be united in a single time by the power of abstraction of the intellect, in the same way in which particulars are categorised under a single general concept. Moreover, this single time that encompasses all times is taken not only to be dependent on the mind, but also in principle to exist only in the mind. Anneliese Maier formulates it as follows: 'The unity under which the discerning intellect combines them has no real existence outside the mind'. It is a revolutionary view, and perhaps Olivi did not abide by it; he seems to have revoked it in the conclusion of the same work.¹⁶

Some thinkers may have gone a little further by assigning to the soul everything that went beyond a primary but limited anchoring in reality. One of them was Peter Aureoli (or Auriol), who wrote around 1318. For him, as for many others, the reality of time was founded on the Now, but everything else was based on the soul. In particular, he held that time as the unique measure of movement (a point to which he adhered strongly) was entirely the work of and property of the soul. His view of the Now as the basis of time was so minimalist that it is debatable what was actually based on the Now. After all, the Now can only ground the scope or progression of time if it links past with future, but it is precisely this function that was eroded by Auriol, who held that the past and the future themselves were dependent on the soul. So at most the Now connects things that it receives through the offices of the soul. In that case, the Now is still independent of the soul, but at the same time it becomes the only aspect of time (it is not even a genuine *component* of time) to remain independent of the soul. Everything else belongs to the soul and is a property of the soul. In principle this

¹⁶ Anneliese Maier, 'Scholastische Diskussionen', pp. 534–538. The citation is from p. 537. The authenticity of this work attributed to Olivi has been called into doubt. For a similar view of Nicolas Bonet in terms of a distinction between a plurality of physical times and a unique mathematical time, see Duhem, *op. cit.*, pp. 428–436.

means that the positive answer to the question *utrum tempus possit esse sine anima* is left floating in the air.¹⁷

What is also left hanging in this way is the reality of motion external to the soul, for if strictly speaking the only part of time that exists outside the soul is the Now, there seems to be no ground for the existence of motion in the external world either. While his contemporaries thought differently, this must have been a conclusion that Auriol was prepared to accept temporarily, if not for good.

William of Ockham, the best-known proponent of this psychological approach, adopted a very different position. He did not doubt the existence of movements, or of change in general. For him the objective reality of time was situated not in the Now but in movement. At the same time, motion, with the succession that it entailed, was the only temporal given that existed in the external world. It was thus not the foundation of something else in time and outside the soul. Only the soul can bring the motion to completion as time by deriving time from motion. In so far as time is different from motion, it falls within the preserve of the soul, because outside motion time cannot exist without the soul: *motus extra non posset esse tempus sine anima*. In the external world, motion and time coincide.¹⁸

This argument of Ockham's had much influence and was widely discussed, defended and attacked. No doubt it is connected with his principle of accepting the existence of as little as possible, later known as 'Ockham's razor', but it had nothing to do with his nominalism, although it has sometimes been connected with it. After all, his standpoint concerns specifically time; the objective reality of motion, for instance, is not at issue—far from it, in fact.¹⁹ Ockham even argued that the soul can only bring about time by appealing to a specific, preferred movement that is given in reality; as many had stated before, that is the diurnal motion of the outermost firmament. At this point Ockham's standpoint suddenly comes closer to that of Averroës, and that is how Ockham saw it too. He considered that he was simply presenting the view of Averroës, and via him that of Aristotle.

¹⁷ Maier, 'Die Subjektivierung der Zeit', pp. 386–387. Cf. Jacques Le Goff, *Time, Work and Culture in the Middle Ages*, p. 50. For further details, see Duhem, op. cit., pp. 368–374.

¹⁸ Maier, 'Scholastische Diskussionen', pp. 550–552' and 'Die Subjektivierung der Zeit', pp. 389–392; for later reactions see pp. 392–395. Cf. Duhem, pp. 374–392.

¹⁹ For a different view see Flasch, op. cit., p. 189.

Nevertheless, through its emphasis on the role of the soul, his theory reinforced the tendency that was already present to tone down the importance of that first motion. The notion that the movement of this celestial sphere determines unique time because it makes possible all other movements or even causes them, slowly but surely lost support. Many considered that it owed its special position solely to its general availability and to its unswerving regularity.

And that means that things might have been different. Basically, there are as many times as there are movements (*tot tempora quot motus*), which here still refers to processes of change. If one nevertheless wants to arrive at a single time, then it will depend on what is the most convincing option in the given circumstances. For us that is simply the daily rotation of the sky. The time that is defined by that movement is then held to be real time, time in a strict, or limited, or most literal sense. In fact, however, the number of times is legion and a different regular, periodical movement can be used as a fixed measure of time (and thus in Ockham's vision as time itself), on condition that the mind selects it as such.

Albert of Saxony is one of those who stated this explicitly and proceeded to develop this position further. Every (periodical) movement that is knowable for us can thus define time, he argues. In fact, there is already a difference within our world, since while for the majority real time is determined by the movement of the stars or the sun, others base it on the movement of the moon. The conclusion that the measure of time can thus also be defined as the movement of a timepiece, however, is not yet drawn, although the first mechanical clocks were already in use at the time. This leap from nature was considered unsuitable, and anyway the clocks of the day were not yet precise and reliable enough. Still, even without this far-going consequence, the views of Ockham and Albert of Saxony are surprisingly close to the principle of Bridgman's operationalism, namely that the meaning of a physical concept is nothing more than a certain agreed measuring operation.

Ockham had followers, and his view of time attracted attention too. Auriol's standpoint, on the other hand, met with little support and failed to provoke much of a discussion. Later on it was more or less consigned to oblivion. However, both standpoints appear to full advantage when they are related to one another. They are complementary. Besides, they correspond to the two opposite but both intuitively plausible conclusions of the thought experiment described in

the first chapter. One conclusion was that if consciousness is eliminated, only the present is left, while the other was that nothing but succession is left. In the first case past and future have disappeared and there is not even any change in the strict sense of the word. In the second case there is no longer any privileged present and the remaining panorama has lost much of its temporal character as a result. The first conclusion corresponds to Auriol's view, the second to that of Ockham and his followers. True, Auriol and Ockham arrive at these conclusions along a different path. After all, these thinkers investigated what the soul contributes to time, while the thought experiment concerned the question of which aspects of time are *not* dependent on the soul. In both cases an answer is provided to the problem of what time still contains without the soul or consciousness.

The second conclusion of the speculative thought experiment has the most to recommend it, at least that was the verdict arrived at in Chapter I. If that is true, then it is understandable, irrespective of any other circumstances that have influenced this outcome, that Ockham's view has been more influential than Auriol's. This does not affect their complementary relation. They belong together as the two opposite poles within fourteenth-century psychologism or mentalism regarding time. They both give full weight to the soul, though for divergent, complementary reasons.

Together, they are in the opposite camp to the realists. For a long time Albertus Magnus was the most vigorous spokesman of the latter tendency, but something changed in that camp as well. Albertus was overtaken and lost his leading position to the precursors of the absolute, Newtonian concept of time: Gerard Odonis and Jean Buridan. For them time is a duration that takes place outside the soul and even entirely independently of all motion.

Gerard was a prominent Franciscan, who became general of his order in 1329. He attracted attention for his radical philosophical positions, among them the thesis that time is eternal and is independent of the world and of movement. At least, this is how his conclusions are presented by Johannes Canonicus when the latter raises the problem of *utrum tempus sit passio vel sequela motus* ('whether time is an accident or an effect of motion') in a commentary.

The first conclusion that Gerard draws is that time already existed for an eternity before the commencement of the world and the creation of anything; the second is that time is not an accident or effect

of motion.²⁰ The creation of the angels played a major role in the argumentation. God did not need to create all the angels at the same time, but that means that one might have been created earlier than another, so that there was already time before the creation of the world and the concomitant change and movement. Gerard probably did not doubt that time was created by God. Johannes Canonicus, however, rejected the argumentation and the conclusions as being incompatible with all philosophy.²¹

Jean Buridan, the famous initiator of the notion of impetus in mechanics and teacher of Albert of Saxony, introduced such an absolute time a little later, but he did so more or less tacitly. Nevertheless, it can be concluded from his discourses that for him time was no longer intrinsic to movement: he conceived of time as duration that is extrinsic to any movement though as such it corresponds to every movement. Buridan's notion of time influenced the physics of his day, because it was this more or less absolute concept of time that was increasingly used by the physicists of Paris and Oxford in a period when philosophers were coming to think about time in an increasingly mentalist or psychological way.²²

By now there were two cultures of time, but there was something curious going on. If the physics of that time had had any of its future experimental character, the gap between the two cultures would have been much smaller. In that case the physicists would have had to provide a better account of the way in which absolute time can be measured, something which interested the philosophers instead, and there would have been at least points of contact between the ideas of the physicists and the views on time of Ockham and Albert of Saxony.

²⁰ *Prima est quod tempus habuit esse ante mundi initium et inceptiōem cuiuslibet creaturæ, sic quod fuit ab æterno . . . Secunda conclusio quam ponit est ista, quod tempus non est passio nec sequela motus.*

²¹ See Maier, 'Die Subjektivierung der Zeit', pp. 397–398; and cf. her 'Scholastische Diskussionen', pp. 555–556. It is conceivable that Gerard's views were based to some extent on the ideas of Avicenna.

²² See Maier, 'Die Subjektivierung der Zeit', pp. 395–398, and 'Scholastische Diskussionen', pp. 554–555. On Buridan's commentaries on the *Physics* and his natural philosophical views in general, see Thijssen, *Johannes Buridanus over het oneindige*, Part I, chs 2 and 3, pp. 57–188.

CHAPTER NINE

INTERMEZZO: THE ARRIVAL OF THE CLOCK

The philosophers discussed in the previous two chapters were by no means the only ones in the Middle Ages to have tackled the problems of time. Interest in the topic did not come to a sudden end after Ockham, Gerard Odonis and Buridan either, nor was it only their ideas that had an influence. Thomist-inspired discussions continued to appear, for instance. Nevertheless, I believe that the main points have been raised in those chapters.

I hope that it has been made clear that the contribution of all these thinkers by no means consisted solely of commenting on the views of time that had come down to them, supplemented here and there with inconsequential additions. The additions and modifications were sometimes subtle enough, and the classical heritage was rich enough for significant variations. It is striking to see how much scope the terms of debate of the classical thinkers left their followers and commentators, especially if one bears in mind that they were also expected (and were often bound by oath as *magistri artium*) to avoid theological questions. In fact, the hundred years from 1250 to 1350 were one of the most impressive periods in the history of thought about time and mind. A good many possible argumentations and solutions were raised. Although almost all of them figured in the context of an exposition of Aristotle's writings (sometimes together with those of Augustine), it was by no means a case of treading water. Still, it was somewhat reminiscent of going round in circles, and at a certain point the interesting possibilities had been exhausted.

In the same years in which philosophising on time, and especially on time-and-mind, reached a climax, a more drastic event took place. The greatest and in fact almost unparalleled contribution of the Middle Ages to the question of time and its concept was situated elsewhere, in the field of technology: the invention of the mechanical clock. This took place at the end of the thirteenth century and was applied on a large scale almost immediately. The fourteenth century, the century of terrible outbreaks of the plague, of famine,

of most of the Hundred Years' War and of the gradual introduction of gunpowder in warfare, was also the century of the rapid introduction of the mechanical clock.

The invention of the mechanical clock was above all the invention of the escapement with foliot (consisting of a bar with adjustable weights on the ends), the brilliant but anonymous discovery of a technical finesse whereby the driving force of a weight could be used via an oscillating movement to produce a regular, unaccelerated (though intermittent) rotation. Apparently this mechanical system was first applied in monastic life. The person responsible for announcing the hours could benefit from it, especially at night and in the early morning. The alarm of a mechanical alarm-clock (*horologium excitatorium*) would remind him to sound the hour himself. The monasteries certainly played an important part in the production and improvement of the very earliest timepieces. English data on the placing of new *horologia* are revealing in this respect.¹

It was not long before the mechanical timepieces were installed in church towers. During the Middle Ages there was a lot of chiming going on in those towers to announce the hours, to warn of danger, to draw attention to religious festivities, and to mark the beginning and end of the working day. Things might have stayed that way, but in many cases practice was different. Town clocks and sometimes even private clocks were introduced that increasingly took over the latter function. Clocks to regulate the working day could already be found here and there from 1325, at first concentrated in the textile towns of Flanders and Northern France. It was not long before such civic clocks came to form a characteristic feature of city life in large parts of Europe, including Northern Italy, Northern Spain, Northern France, Flanders, England and Germany.

The new clocks were perhaps automatic bells at first but they were soon fitted with a face and hour hand. The hour hand went round one, two or four times a day; the minute hand was introduced a few centuries later.² The hours that were sounded or indicated were

¹ See J.D. North, 'Monasticism and the First Mechanical Clocks'. A famous clock was designed by Richard of Wallingford, abbot of St Alban's; see North, *God's Clockmaker*.

² There were timepieces with two hands in the sixteenth century. However, as we learn from paintings, many old church towers still had a clock with a single hand for a long time (for example, Pieter Saenredam's painting *View of the Mariaplaats* from 1663 showing the tower of Utrecht Dom).

New Style hours, i.e. twenty-four hours of equal length. This new division replaced the traditional division of the day into twelve daytime hours and twelve nocturnal hours. This division had prevailed for millennia, but its existence was abruptly endangered by the mechanical clock. The church clung to it as long as it could with its canonical hours, but it soon disappeared from the scene in secular life. In many places it was not long before the quarter-hours were sounded as well as the hours.

Moreover, the new mechanical clock was often a prestige object. In such cases it was sumptuously executed and often fitted with astronomical devices to indicate the phases of the moon, the hours of sunrise and sunset, and the main positions of the planets. There were elaborate, luxurious clocks of this kind in Strasbourg (already around 1350!), Bologna, Lund, Lübeck, Bern, Padua and Prague.³

These clocks were not particularly accurate. The best water-clocks were probably more precise until the seventeenth century, when Hooke and Huygens improved the precision of the mechanical clocks. In particular, Christiaan Huygens' perfecting of the pendulum clock, which had been introduced by now, was a major improvement.

Thus the introduction of the mechanical weight-driven clock around 1300 was a decisive breakthrough. It regulated the public time of the day in a much more obtrusive way than used to be the case, and it made time more audible and visible than ever. It was the first clock to tick. Something of the impression that these clocks must have produced can be gauged from the fact that the comparison of the cosmos with a timepiece began to gain currency before the end of the fourteenth century. Nicholas Oresme was probably one of the initiators of the metaphor of the cosmos as a timepiece, with God as the supreme clockmaker. That image was to play a major role in later mechanistic determinism and the related occasionalism.

The weight-driven mechanical clock also had plenty of potential for domestic use, but a new invention was necessary for a portable mechanical clock (portable sundials had already been in existence for some time). This was the spring-powered clock, which was invented

³ See Cipolla, *Clocks and Culture*, pp. 43–47; cf. Le Goff, *Time, Work and Culture in the Middle Ages*, pp. 43–50. The oldest, still working mechanical clock is apparently that of Salisbury, which dates from around 1380; cf. Boorstin, *The Discoverers*, p. 66.

in the beginning of the fifteenth century. The principle was extended to that of the double spring in the seventeenth century, in which not only the driving mechanism but also the regulation is governed by a spring. The spring-powered clock laid the foundation for the portable watch carried in the pocket or worn around the neck, that could be consulted at any time and in any place. Another problem of great social, commercial and technological importance was the development of a good ship's clock. This was drastically perfected in the eighteenth century after a competition organised by the British Parliament. The call for a solution in 1714 was finally answered in 1762.⁴

All of these instruments gave time an increasingly central place in public, domestic and individual life. Compared with the clock, the calendar played second fiddle in this process. Of course, it must have had a great influence in the past. An agreed or prescribed calendar not only regulated but probably also reinforced the cyclical aspects of time. The fact that from an early period, however, the years were named or numbered in some way or other must have stimulated the linear perception of time. At the least, recollection over longer periods and the reference to the past will have become less diffuse as a result.

Like the division of the day, the system of the Western calendar, which was based on the solar year and the lunar cycle, went back to antiquity. Even the seven-day week, a period without a natural basis, had a long history. Originating in Babylon, it came to prevail over other divisions, such as the ten-day week of the Greeks and the eight-day week of the Romans. The Jewish week was also an important factor via Christianity, but the influence of the seven-day astrological week should not be underestimated either. This calendar was adjusted in all kinds of ways in the course of the centuries with regard to the commencement and the precise division of the year. More particularly, the regulation of the feast days (first the Roman ones, later the Christian ones) continued to occupy people's

⁴ John Harrison, assisted for a time by his brother, had worked on it for almost that entire period with incredible determination and inventiveness. The obstruction that he eventually encountered in trying to secure recognition for his product is a sad chapter in the history of the clock. See Landes, *Revolution in Time*, ch. 9.

minds until late in the Middle Ages and after. In spite of all this, however, the basic structure remained intact.⁵

The only drastic, post-classical change in the Western calendar was the introduction of the Gregorian calendar to replace the Julian one. This change implied a leap of ten days. Its introduction from 1582 on proceeded so sluggishly that Europe was divided into two calendrical regions for centuries. Where the Pope had no say, as in England and Russia, the introduction of the new calendar was delayed, sometimes even until the twentieth century, and today some countries or regions still celebrate Christian feast days in accordance with the Julian calendar. Even the Dutch Republic had two calendars for more than a century. The provinces of Holland and Zeeland had introduced the Gregorian calendar almost immediately through the intervention of the Duke of Anjou, but the other provinces did not follow suit until soon after 1700. By then the difference had increased from ten to eleven days, since according to the Julian calendar, but not according to the Gregorian calendar, 1700 was a leap year. Apparently people coped with this schism without too much difficulty, which in itself suggests that the sense of time of Europeans was not strongly influenced by the calendar.

At any rate, the influence of the new calendar was minimal compared with that of the mechanical clock. The modern sense of time, the increasing orientation towards time, which many have come to regard as a Western obsession with time, originated in connection with the introduction of the new clock, not the new calendar. Still, of course that does not mean that everything remained limited to the division and use of the day. From there the effect spread naturally over larger units of time.⁶

It would be wrong to see the original connection as proceeding in only one direction. Certainly, the introduction and rapid diffusion of the mechanical clock had a profound effect on society (especially urban society) and on people's minds. Vice versa, it was society and its members that came to make high demands on the measurement

⁵ For an incisive account of the discussions regarding the revision of the calendar see North, 'The Western Calendar'. For information about several other cultures see Aveni, *Empires of Time*.

⁶ Cf. Landes, *op. cit.*, esp. Introduction and chs 3, 4 and 5. For a brief outline with instructive quotations see Levine, *A Geography of Time*, ch. 3.

of time. A comparison with contemporary China is striking in this respect. China imported Western clocks from the fourteenth century, and in the sixteenth the Italian Jesuit missionary Matteo Ricci made a major effort to win China over to the mechanical clock. However, these clocks were mainly used in China as curiosities, collectibles and toys, and they failed to exert any noticeable social influence. Apparently the Chinese had no social or political demand for these devices. In fact, mechanical water-clocks were made in China at a very early date, but they soon disappeared, and Joseph Needham's claim that they are precursors of the Western mechanical weight-driven clocks is probably exaggerated.⁷ Today the clock still functions in very different ways in different cultural areas. By no means every culture is characterised by a far-reaching obsession with time, even though time is everywhere publicly measured and taken into account.⁸

The modern Western sense of time began simultaneously with the clock, and will both have influenced the development of the clock and been influenced by that development. No doubt a plurality of factors were involved in this mutual influence. Two tendencies are particularly salient: the emergence of early capitalism and industrialism; and the shift from a predominantly qualitative to a far more quantitative natural science. The innovations in the determination and awareness of time played an important part in these tendencies, both of which made their appearance in the late Middle Ages.

Perhaps there was even a connection with the big epidemics. It has sometimes been argued that the catastrophic mortality that they produced had a positive influence on the emergence of the early stages of the capitalist and technological economy. If that is true, they would thus have indirectly furthered the rise of the modern Western sense of time.⁹

The rise of capitalism with its rapidly expanding money economy is probably the central factor in this whole process. The merchants, manufacturers and money-lenders, often united in one person, had a lot to gain from a reliable measure of time. Different economic

⁷ Cf. Landes, *op. cit.*, chs 1 and 2; Boorstin, *op. cit.*, section I.III.9; Needham, *Time and Eastern Man*, ch. 3.

⁸ See Levine, *op. cit.*, *passim*. For a more theoretical account of different systems of chronology, see Gell, *The Anthropology of Time*, Part I.

⁹ See e.g. David Herlihy, *The Black Death and the Transformation of the West*.

and other cycles regulated the ups and downs of this professional group. It was by taking advantage of them that they made their profits. In a certain sense they lived from time; time was money for them. The situation was not the same for Jewish as for Christian money-lenders, for the latter were faced for centuries with the church's resistance to the charging of interest in economic transactions. For a long time Christians were prohibited from doing so. That ban was based, among other things, on a pronouncement of Jesus himself.¹⁰ Philosophers from Albertus Magnus on also based it on statements by Aristotle, and Roman law played a role too.¹¹ The prohibition also applied to some other forms of the calculation of a period of time in terms of money. That was logical in the light of another argument of the church: usury and related transactions are to be condemned because they boil down to the sale of something that only belongs to God, namely time. Nevertheless, the resistance weakened, and in the course of the fourteenth and fifteenth centuries exceptions to the prohibitions were gradually admitted. The Reformation speeded up that process; Calvin had no difficulty with the charging of interest on loans to businessmen, as distinct from loans to the poor. In the end the churches accepted the elementary principles of capitalism.

Moreover, religious or even divine time became involved with worldly time in several ways. It is known, for example, that the precise division of the day in the monasteries, of which there must have been tens of thousands in Europe, was a fertile breeding-ground for the modernisation of the secular measurement of time. The Benedictines played a pioneering role in this respect, and somewhat later the Trappists and other Cistercians followed suit. If it is true that the first mechanical clocks were to be found in the monasteries, this is an eloquent illustration of that involvement.

Much more is at stake, however, including the higher forms of religious chronology. Within a broad perspective, large-scale periods such as those of the first and second covenant and the millennium were given a place within the divine plan of salvation, but small-

¹⁰ *Luke* 6: 34–35.

¹¹ B. Noonan, *The Scholastic Analysis of Usury*. For many details about the religious background, the historical development and the connection with purgatory, see also Le Goff, *La bourse et la vie*; on the role of time see ch. 3.

scale forms of such accommodation were more significant in this connection. They were reinforced in a striking and remarkable way after the establishment of the notion of purgatory in the course of the twelfth and thirteenth centuries, as described in detail by Jacques Le Goff in *The Birth of Purgatory*. It is almost inconceivable that representations concerning this part of the afterlife did not have a stimulating effect on the sense of time of the faithful. After all, the idea that sins can be atoned within a specific period of time must have encouraged and been encouraged by an active, calculating sense of time. More particularly, researchers like Ricardo J. Quinones and Richard K. Fenn have attributed an important place to Dante's *Purgatorio* in the evolution of the modern sense of time.¹²

It is true that the general conception of the world in Dante's *Divina Commedia* is dualistic: the earth versus the heaven, time versus eternity. Dante longed for a situation in which the terrestrial city would reflect the celestial city because earthly ends would have been subordinated to the Christian doctrine of salvation, but he was convinced that the terrestrial city was actually marked by Cain. Particularly tormenting for him was the fact that this applied so strongly to his own city of Florence, whence he was banished and where civil war and thus fratricide triumphed. Certainly, according to a famous passage, the terce and the nones that had been rung when, according to Dante's great-great-grandfather Cacciaguیدا, Florence was peaceful, sober and chaste, could still be heard ringing from the church bells within the old city walls.¹³ But (by now) time was a long way from being the moving image of motionless eternity, for time was accompanied by degeneration and decay, and no longer bore any resemblance to an eternal present. Even living on after death in the form of progeny or fame, traditionally regarded as an approximation of immortality, had lost its value under these conditions.¹⁴

¹² See the fine study by R.J. Quinones, *The Renaissance Discovery of Time*, and the here and there less convincing *The Persistence of Purgatory* by R.K. Fenn. André de Laet, *Nu is er ook toen*, ch. 2, is also informative and illuminating on these topics. For Le Goff, in *The Birth of Purgatory*, the topography of purgatory is a more urgent issue than its temporal aspects, but see e.g. pp. 227–230 and 352–355 (on Dante).

¹³ *Paradiso*, canto XV, 97–99.

¹⁴ Cf. Quinones, op. cit., pp. 28–71.

But between heaven and hell lies the Mount of Purgatory, where a striking combination of the earthly and heavenly chronologies takes place. To start with, there is the remarkable fact that, unlike his visit to hell and heaven, Dante's visit to the mount is marked by the passing of time. The position of the sun is followed, it rises and sets, and Dante falls asleep a couple of times. More important is that time is pressing. That is why Cato hurries up the spirits. While Dante, Virgil and their companions are enjoying a poetic song, Cato intervenes and shouts: 'What is this, tardy spirits? What negligence, what idling is this? Run to the mountain'.¹⁵ After him Virgil repeatedly urges Dante to hurry, for example at the end of Canto IV and the beginning of Canto V. In Canto XII Virgil reminds him 'that this day will never return', which Dante immediately understands because he was 'used to exhortations not to waste time'.¹⁶

During the journey through hell Virgil had already repeatedly called for them to hurry, but during the visit to the Mount of Purgatory these exhortations take on a new, much stronger tone. This is because they match the conditions of those who dwell there, for they, unlike those who dwell in hell, are subject to a temporal regime. Time reigns here. The temporary or passing fire burns here, in contrast to the everlasting fire of hell.¹⁷ Atonement and purification have a prescribed duration. At the foot of the mountain the temporal connection between sin and atonement is indeed very direct, because the waiting time is as long, or a fixed number of times as long, as the length of the sin, namely the period of delay before repentance.¹⁸ There is thus an atonement of time by time: *dove tempo per tempo si ristora*.¹⁹

One of the most eloquent examples of the temporal regime on the Mount of Purgatory is to be found in Canto XXIV. Forese Donati has no time to keep his old friend Dante company any longer and he runs away like a galloping knight for, in his own words,

¹⁵ *Purgatorio*, Canto II, 120–123.

¹⁶ *Purgatorio*, Canto XII, 84–87.

¹⁷ *Purgatorio*, Canto XXVII, 127. This opposition already occurs in Augustine. See Le Goff, *The Birth of Purgatory*, pp. 69, 73, 77.

¹⁸ *Purgatorio*, Canto III and XI.

¹⁹ *Purgatorio*, Canto XXIII, 84. The symbiosis with the world of the living is apparent from the fact that the time of atonement and purification can be reduced through the prayers of the next-of-kin.

'time is precious in this kingdom'.²⁰ This extremely significant, not to say precious expression has since become proverbial and has been repeated and varied countless times.

It reappears in virtually the same form in Quinones' second chief witness, Francesco Petrarck, one of whose letters is on the subject: *Quam cara res sit tempus*. The reference here is not to purgatory but to life on earth, where time is scarce and therefore precious, indeed priceless; in fact every day is irreplaceable. Petrarck would have liked to be able to say of himself that he had never wasted a day in his life, but that was not the case. Seneca could have taught him better. Still, he can say in all truthfulness that he has not lost a day without being painfully aware of the fact.²¹ Quinones shows Petrarck's interest in time in several other letters, in a few important treatises, including the three dialogues with Augustine (*Secretum meum*),²² and in a good many of his poems. Among the latter are the Italy canzona (strophe 7) and sonnet 272, which begins:

La vita fugge, e non s'arresta una ora,
e la morte vien dietro a gran giornate,
e le cose presenti e le passate
mi danno guerra, e le future ancóra;

(Life runs away and never rests a moment
and death runs after it with mighty stride,
and present things and things back from the past
and from the future, too, wage war on me.)²³

But pride of place belongs to the last but one of his *Triumphs*, the *Triumph of Time* (*Triumphus Temporis*), in which Time triumphs over Fame, who had triumphed over Death in the previous poem. This cycle in terza rima, which is primarily the account of a lengthy dream, begins with the *Triumph of Love*, in which Amor leads his countless victims in a triumphal procession. In the second poem, the *Triumph of Chastity*, Amor is defeated by Laura and in turn led to Rome. Then comes the *Triumph of Death* with the death of Laura.

²⁰ *Purgatorio*, Canto XXIV, 91–92: *Ché 'l tempo è caro in questo regno*. Cf. also De Laet, op. cit., pp. 62–63.

²¹ Petrarck, *Rerum Familiarum*, XVI, 11; *Letters on Familiar Matters*, pp. 317–319. The letter is addressed to Petrarck's friend and assistant Francesco Nello.

²² The full title is *De secreto conflictu curarum mearum*.

²³ Petrarck, *Selections from the Canzoniere and Other Works*, trans. Mark Musa, p. 65.

After the *Triumph of Fame*, in which three groups of heroes pass in review led by Fama, comes the *Triumph of Time*, in which the poet sees how, in the face of insatiable Time, Fame turns out to be no more than a second, equally ineluctable form of death. Time can only be defeated by Eternity, which is what takes place in the last poem. So here on earth there are five triumphs, crowned by the triumph of Time. The sixth we owe to God alone.²⁴

Petrarch was perhaps the first author in whom the modern wrestling with time is to be seen in its full intensity and drama. The elements of this sense of time such as the awareness of the fleeting nature of time, the need not to waste the available time, the sense that time can be pressing, are of course time-hallowed, and were already the subject of reflection in antiquity.²⁵ From the fourteenth century on, however, these traditional elements acquire a new intensity. The power and effect of time are experienced more intensely, and resistance to them takes on a more dramatic character. This resistance becomes a systematic, highly conscious, fervent and well-considered opposition, or even (the metaphor is often a military one) a relentless campaign. A great variety of considerations, actions and reactions are to be found in this context: personal rules of conduct alongside the glorification of the incorruptible value of art and poetry, practical methods of education and school curricula alongside almost superhuman principles and ideals.²⁶

In Petrarch all of this is in the last resort still subordinated to an orientation towards Christian eternity. Perhaps that is particularly true towards the end of his life, but it can already be found much earlier when, around his fortieth year, he admonishes himself for his mortality, his weaknesses and ambitions through the mouth of Augustine in the *Secretum*. The same is true of some later figures: one of Quinones' chapters is on Milton. All the same, one gains the impression that the leading writers in this period break with a more resigned attitude. No one will deny that before then people were already aware of being under the sway of time and that they had always endured

²⁴ Petrarch, *Triumph of Eternity*, 121–123. The whole cycle was extremely popular in the Renaissance. Benno Geiger published a (rather free) German translation in terza rima. E.H. Wilkins published an English translation in non-rhyming terze. A very illuminating study is Aldo S. Bernardo, *Petrarch, Laura and the 'Triumphs'*.

²⁵ See above, pp. 47–49.

²⁶ Cf. Quinones, op. cit., chs 1, 3 and passim.

the harsh effects of the passage of time, the brevity of life and the cruelty of death. Many a touching funerary epitaph or poem bears witness to that, but from the fourteenth century on this feeling assumed a different character. It gained in intensity, was elevated to a theme of life, and was converted into an aggressive attitude of alertness and active resistance that went beyond a defensive or lamentatory attitude. An inevitable consequence of this was that the traditional sense of time became individualised and secularised.

That is when the basis of the modern, Western sense of time was laid. The individualisation was to be followed by an unprecedented degree of socialisation. Industriousness and energy became important virtues, more important than they had ever been, while deliberation and practical insight (*phronēsis*, *prudentia*) acquired a new meaning.

In the course of the centuries Northern Europe took over the lead from the South in this respect.²⁷ Erasmus was one of those Northern torch-bearers. Among the companions of Folly he included not only drunkenness, pleasure and luxury, but also in particular forgetfulness (Lethe), laziness (Misoponia) and madness (Anoia).²⁸ In *Utopia*, his friend Thomas More sketched a situation in which people only had to work six hours a day, but were obliged to spend their leisure hours usefully; and the prevailing morality did not tolerate any shirkers. It is generally accepted that the Reformation strengthened these tendencies even further, contributing to the popular view that the devil finds work for idle hands.

In addition, the influence of the belief in purgatory was to be felt for a long time and perhaps remained the driving force. In his *The Persistence of Purgatory*, Richard Fenn presents examples to show that in the centuries after Dante, earthly life itself was increasingly described as a purgatory by preachers and moralists.²⁹ On this view, human life is conceived as a succession of trials and atonements; the all-important mission is to purge oneself from sins as far as possible and to make use of the available but always limited time for that

²⁷ Cf. Landes, op. cit., pp. 92–93.

²⁸ *The Praise of Folly*, p. 17.

²⁹ The book contains questionable points here and there and sometimes suffers from a weak composition, but the citations and the general tenor of the argument are convincing enough.

purpose. In a later stage this mission took on a secular guise as the obligation to spend the available time sensibly, usefully and efficiently. No time must be lost! This heralded the advent of the new temporal regime. All kinds of clerics, including Puritan preachers, who are little-known today but were very influential at the time played a key role in this development. According to Fenn, John Locke also made an essential contribution to it with his views on religion and education. The effects of all this were to be particularly conspicuous in the USA in the eighteenth and nineteenth centuries.³⁰

The symbiosis of religious and earthly time in which they took on shared characteristics and became caught up in the same temporal economy had a paradoxical character, for in the longer term it was a factor in the emancipation of worldly from heavenly time. It made worldly time important, gave it a spiritual meaning that it had not (at least not in this way) had before, and eventually reinforced the autonomous value and independent importance of worldly time. The spiritual meaning that it received and in a certain sense retained through it all served to enhance the value of the lower more than to enlarge that of the higher.

In fact, this emancipation commenced early on. It was already symbolised by the system of the double clocks that began to spread through Europe in the fourteenth century, with one clock for the church and another for work. It was not just the merchants and manufacturers who exerted their influence in favour of the new secular clocks; the reflections of philosophers and natural scientists played a role in the background. According to the historian Jacques Le Goff, merchants and scholars were allies in this respect: 'Their joint efforts may have been responsible for fracturing time and for freeing the time of the merchants from biblical time'.³¹ It is a cautious formulation but it sounds plausible, if only because many different tendencies interacted here. Were not a good many more professional groups also involved in the emergence of the new sense of time, such as poets, craftsmen, monks and humanists?

³⁰ Fenn suggests that Charles Taylor with his characterisation of Locke's notion of personality as 'the punctual self' was referring to a problematic relation with time. This is, I think, based on a misunderstanding. Fenn, *op. cit.*, p. 83, cf. also 93 and 97; Charles Taylor, *Sources of the Self*, ch. 9.

³¹ Le Goff, *Time, Work and Culture in the Middle Ages*, p. 42.

A separate role was played by draughtsmen, graphic artists and painters, because the centuries in which the mechanical clock first penetrated social life, and afterwards private life too, were also the centuries in which the new allegorical representation of time described in the first pages of this book secured a prominent place for itself in the arsenal of pictorial stereotypes. It was the representation of time as an old, winged man with an hourglass and a scythe or a sickle: Time as a grim Kronos, or as a more congenial Father Time.

It started with the illustrations to Petrarch's *Triumphs*. The cycle enjoyed great popularity for a long time and appeared in many illustrated editions in the fifteenth and sixteenth centuries. Time appeared here in a new guise, towering above the multitude on a chariot drawn by deer or other animals. There was nothing in Petrarch's poem that corresponded to that: Time appears there with the chariot of the sun that passes through the sky and is otherwise an abstract force that controls and destroys life and fame.

The new allegorical image of time as an old winged man was represented in all kinds of ways for centuries. Its function could change and its connotations were by no means always negative. For instance, it was strikingly positive when it came to the ability of Time to bring to light and to reveal truth or innocence. *Veritas filia temporis* (Truth daughter of Time) was then the motto. It was an old idea, but one that was inserted into the new context from the sixteenth century on. Both Protestants and Catholics linked it with the expectation that time would reveal the truth of their faith. In the middle of the seventeenth century Bernini worked on a marble sculpture to represent the revelation of Truth by Time. He completed the figure of Truth, but failed to realise that of Time.³²

In the meantime the illustrated literature had produced a surprise at the beginning of the sixteenth century. This was Stephen Hawes' vast, allegorical poem *The Pastime of Pleasure*, in which Time appears as an old man, but one who carries a clock instead of an hourglass.

The poem describes the adventures of Graunde Amoure, who is

³² His sculpture is in the Villa Borghese in Rome. Slightly earlier Poussin did a painting of the same subject, which is only known from a copy and a print. A late example is a painting by François Lemoyne from 1737. An example from music is Handel's 1737 oratorio *Il Trionfo del Tempo e della Verità* (the English version *The Triumph of Time and Truth* dates from 1757). It is an adaptation of his earlier work *Il Trionfo del Tempo e del Disinganno* (1708).

also the narrator, and especially everything that he has to accomplish in order to marry his loved one La Belle Pucell. He is successful, and for years he lives happily with his adored wife. After his death three figures appear in succession on his grave: Dame Fame, Tyme, and Maria or Dame Eternyte. It is likely that this final part of the poem betrays the influence of Petrarch's *Triumphs*. Hawes' personification of Time is a winged and feathered old man with a beard who bore the sun, the moon and the planets on his body and his two wings; on top of his head was Saturn. Instead of a scythe he had a sword, and 'In his lefte hande he had an horology / And in his ryght hande a fyre brennyng'. This Time appears in full panoply in the illustrated editions of 1509 and 1517.³³

He announces that he will destroy land and sea, moon and stars. Fame had also been vanquished by him. When it comes to people, however, it depends on how they make use of the available time, whether virtuously or not. In the end Time calls himself a guide to eternity, 'the lode sterre to dame eternyte'. He has held sway since the creation and has no qualms about vigorously emphasising that fact, recalling his role as the revealer of deceit into the bargain:

Do not I tyme cause nature to augment
 Do not I tyme cause nature to decay
 Do not I tyme cause man to be present
 Do not I tyme take his lyse away
 Do not I tyme cause dethe take his say
 Do not I tyme passe his youth and age
 Do not I tyme euery thinge aswage?

Back to the philosophers whose work was described in the last two chapters. What is their position in relation to the theme of *this* chapter? What is the relation of their speculations to the new sense of time?

The components of that sense of time reflect in a certain sense the range of those speculations. It is not that they follow from them or are determined by them, but a certain analogy can be detected, an affinity in terms of not just form but also content.

³³ *The Pastime of Pleasure* by Stephen Hawes, pp. 215–218. Cf. Panofsky, 'Father Time', p. 92 and Plate XXVII, ill. 51. For a long time 'horologium' or 'horology' could refer to various instruments for measuring time, such as a clepsydra or a sundial, but from the fourteenth century on the word was applied particularly to mechanical clocks. That is what the illustrator took it to mean.

To start with, there is the awareness that time is a force outside us, a force to which we are entirely subordinated. Seen in this way, time moves on inexorably and bears us along with it. We are its prisoners, and attempts to escape from it or to gain control of it are in vain. This corresponds to the realist philosophy of time of Gerard Odonis and Buridan. Of course it is not the same, but the awareness in question is the existential translation, as it were, of the philosophical position.

The breakthrough of the new machinery means that, in spite of everything, people can still come to grips with time. They can keep an eye on time and even ensure that they are constantly reminded of it. The result is that, to a certain extent, time becomes a human product. Time becomes more and more what the mechanical time-pieces say it is. The measure, although in principle present in the external world, nevertheless acquires the characteristics of a man-made instrument. This component, one could say, corresponds to the moderate realism of Averroës, Albertus and Thomas.

The anthropological elements in this position are open to reinforcement. In that case, following time precisely is increasingly felt to mean regulating time, and by extension controlling and dominating time. Time becomes something that people use, for good or bad. It is up to human beings to take the initiative. This can go so far that, as Seneca had done a millennium and a half before, they get the idea that they own time. Le Goff has recalled Leon Battista Alberti's dialogue *Della Famiglia* in this connection, in which a father tells his children the three things that people have in their possession: their fortune, their body, and time.³⁴ This all corresponds to the anti-realist end of the philosophical spectrum, in other words the mentalist views of time of Olivi, Auriol and Ockham. Of course, again these two things are not identical, but they do display a structural analogy and affinity.

Mentalism can turn into realism when the mental itself becomes the foundation of all reality. Equally, the self-conscious attitude towards time can turn into a situation of fatal subordination. This happens when the desire to control and dominate time becomes an obsession. Possession, or supposed possession, turns into obsession, and

³⁴ Le Goff, *Time, Work and Culture in the Middle Ages*, pp. 51–52.

the master becomes a slave. The circle is closed, even though the original, more or less automatic and resigned subordination has made way for an unwanted, imposed and sometimes even neurotic subservience. Time, which initially belonged to God, has then itself become a sort of divinity.

CHAPTER TEN

FROM RENAISSANCE TO BAROQUE

During the three centuries after the era of Auriol, Ockham and Buridan, that is, the years from roughly 1350 to the middle of the seventeenth century, Aristotle's teachings retained their very important position. More in particular, they continued to set the tone in the teaching of philosophy in most of the universities. As has been seen, however, this doctrine admitted of a variety of interpretations, and that continued. Important in this connection was the fact that during the fifteenth century Aristotle was increasingly read in Greek and was translated in accordance with new principles derived from humanism. By virtue of that alone, the Renaissance commentaries on the writings of Aristotle did not constitute a petrified system, in spite of what has often been assumed, although at the same time it should be recognised that they did not produce much of lasting significance either.¹

Of course, not everyone was equally tied or dedicated to Aristotelianism. Important developments took place outside the regular university education, and the limitations there were far fewer. In fact, generally speaking, this marked the beginning of a long period, which was to last until the middle of the eighteenth century, in which the leading philosophers were not attached to a university.

The most striking aspect was the strong revival of Platonism in fifteenth-century Italy. Its centre was Florence, and various humanist scholars contributed to it. It was now that most of the Platonic dialogues finally became available, either in the original Greek or in Latin translation. The leading figure in this Platonic revival was Marsilio Ficino, who was head of the so-called Academy of Florence

¹ Cf. Copenhaver and Schmitt, *Renaissance Philosophy*, ch. 2; and C.B. Schmitt, 'Towards a reassessment of Renaissance Aristotelianism'. The study of the philosophy of the Renaissance is going through something of a revival, so it is quite possible that its assessment will change in the years ahead. The same is true of the role of Aristotelianism, especially even Aristotelian physics.

in the second half of the fifteenth century.² Under the aegis and with the support of several of the Medici family (first Cosimo, and finally Lorenzo), Ficino was responsible for a complete Latin translation of Plato's dialogues with influential commentaries, especially on the *Symposium*, the *Phaedrus* and the *Timaeus*; later in life he even translated the *Enneads* of Plotinus and the work of his followers such as Iamblichus and Proclus. He also translated the famous *Corpus Hermeticum* and wrote letters and treatises in which he expounded his own philosophical thoughts. Thanks to the recent invention of printing, Ficino's writings enjoyed a much more rapid dissemination than had been possible before. It was all particularly beneficial to the revival of Platonism—yet another example of the irony of history: the philosopher who had fulminated against writing in his *Phaedrus* was the first to reap a large benefit from the art of printing.

Along with kindred spirits, Ficino had a lot of influence on the development of philosophy. Platonism became one of the major currents in Renaissance philosophy. Not even higher education was immune. From about 1500 on, the study of the philosophy of Plato was taught in several universities, perhaps first in Leipzig around 1490, followed by Paris and somewhat later by Padua and Pavia. In the last quarter of the sixteenth century even a few special chairs in Platonic philosophy were established in Pisa, Ferrara and Rome. Those in Ferrara and Rome were initially held by the most important Platonist of his day, Francesco Patrizi.³

Besides his extremely influential translations of and commentaries on Plato, Ficino's main work was and still is the *Theologia Platonica*, which is primarily devoted to the immortality of the human soul. In this work he presented his view of the hierarchical structure of the cosmos, largely in the spirit of Plotinus, but above all he glorified the rational human soul. In its capacity as pure and non-material

² Traditionally, the Academy was seen as a Platonically inspired circle of like-minded individuals. For a critical modification of that picture in the direction of a school with pupils, see the article by James Hankins, 'The Myth of the Platonic Academy in Florence'.

³ For a clear and relatively succinct survey of philosophy in the Renaissance see Copenhaver and Schmitt, *op. cit.* Much relevant information can also be found in P.R. Blum, *Philosophen der Renaissance*. For the introduction of Platonism in university education see also the article by Schmitt, 'L'introduction de la philosophie platonicienne dans l'enseignement des universités à la Renaissance'.

form, it was incorruptible. In view of the final destiny of humanity, namely to behold the divine or the One, the soul had to be immortal too, for that destiny only made sense if the soul would eventually be able to experience the divine for ever. Moreover, however, the soul was the pre-eminent intermediary for Ficino, and as such it was essential for the coherence of the cosmos. He considered that the soul mediated between spirit and matter, the intelligible and the sensorial, eternity and time. It could exist both inside and outside time, and could move from time to eternity and back again.⁴ It was indeed the greatest of all miracles. For Ficino the soul formed the absolute centre of the universe and was the link that held the universe together; in the words of P.O. Kristeller, it was 'the bond and juncture of the universe' (*nodus et copula mundi*).⁵

In a certain sense the entire cosmos was thus dependent on the soul. More in particular, time could not exist without the soul, because according to Ficino time only exists in connection with eternity, and only the soul brings about that connection. However, he does not go into this dependence specifically in more detail; time as such probably did not interest Ficino enough to devote a separate study to it. Still, he did intervene in the time-hallowed dispute on the origin of time as described in the *Timaeus*. Most of the classical Neoplatonists had held that Plato's account of the activities of the demiurge should not be taken literally and that he had certainly not intended it to be understood that the world had been created together with time. Ficino disagreed; like Aristotle, he believed that this conclusion could indeed be drawn. Unlike Aristotle, however, he did not think that Plato had been mistaken. According to him, the world was created at a certain moment (the very first moment) together with time. Of course, Ficino's interpretation and assessment facilitated a biblical interpretation of the *Timaeus*.⁶

⁴ Marsilio Ficino, *Traktate zur Platonischen Philosophie*, pp. 99–103.

⁵ *ut merito dici possit centrum naturae, universorum medium, mundi series, vultus omnium nodusque et copula mundi*. Ficino, *Platonic Theology*, vol. I, pp. 242/243. Cf. Michael Allen, 'Marsilio Ficino's Interpretation of Plato's *Timaeus* and Its Myth of the Demiurge', pp. 399–400; *The Encyclopedia of Philosophy*, vol. 3, pp. 197–198; Kristeller, *Eight Philosophers of the Italian Renaissance*, p. 43; Ficino, *Traktate*, pp. 20–22. See above, n. 5.

⁶ Whether and to what extent Ficino considered a biblical interpretation of the activity of Plato's demiurge to apply in other respects is a difficult question; see the article by Michael Allen, 'Marsilio Ficino's Interpretation of Plato's *Timaeus*'.

A slightly different approach is represented in the work of his younger contemporary Giovanni Pico della Mirandola, the author of the famous treatise on human dignity in which, like Ficino, he classified humankind as the great wonder of the creation. The reason he gives, however, is not the intermediate position of the rational human soul, its place between time and eternity, or even its role as the juncture that holds the cosmos together. That may all be the case, but for Pico it is much more important that man has been given this function in order to understand the world and to choose his own place in the world. His creator is credited with having given him a large measure of freedom to organise his own life. As a result, a human being can come to resemble a plant or an animal, but can just as well become an angel or a god. Every possibility is open; nothing is ruled out a priori.

This view on the place of humankind formed the opening of the treatise, which was intended in its entirety as an introduction to the nine-hundred theses that Pico, who had just graduated, had wanted to defend with much bravura in Rome in 1486. Thirteen of them were rejected as unorthodox or judged to be dubious,⁷ and when Pico objected, the Pope condemned all nine-hundred of them. At this Pico left for France; a year later, he installed himself in Florence with the approval of the Pope and under the aegis of Lorenzo de' Medici. Among his publications was a sevenfold interpretation of the account of the creation in *Genesis* 1:1–27, the *Heptaplus*.

In the fourth chapter of the second section of this work, Pico described how the revolution of all the celestial bodies produces the day and how the motion of the sun produces the year. It is doubtful whether this was also intended as an account of the origin of time. It is conceivable that the fulfilment of his grand ambition—to demonstrate the unity of the teachings of Plato and Aristotle—would have led him to draw specific conclusions concerning the relation between time and the soul, but as a result of his premature death, nothing of that work materialised except an account of Being and the One, so we have to fall back on conjecture. Nevertheless, it is likely that Pico, like Ficino before him, held that time cannot exist independently of the soul, since for Pico too it is man who unites time and eternity, and the former is inconceivable without the latter.

⁷ Copenhaver and Schmitt, *op. cit.*, p. 169; Blum, *op. cit.*, p. 70.

The sixteenth century produced several natural philosophers who concerned themselves more directly with time. The most important of them was probably Bernardino Telesio, a South Italian from Cosenza, where he spent the greater part of his life. He too formed an Academy around himself for philosophical and scientific discussion. He published one major work, which at first consisted of two books, later of four, and finally of nine: *De rerum natura iuxta propria principia* (On the nature of things according to their own principles). Telesio considered that humankind has a second, supernatural and immortal soul (*anima*) that derives from God, but he devoted himself mainly to the body and to the first, natural, material and mortal soul (*spiritus*) that was tied to the body. Knowledge at this level, he argued, was determined by the senses. That did not stop him from devising a comprehensive theory of the composition of the universe. According to that theory, the universe consists of three principles: heat, cold and matter. The first two are active and non-material principles and originally they belong to the sun and the earth respectively; the third is a passive and, of course, material principle. All physical events are taken to be the result of the antagonistic alternation of heat and cold in the control of matter.

This was patently at odds with Aristotelian doctrine, and so was Telesio's conception of time. He argued that time is not dependent on motion, but is prior to it because all motion takes place in time and presupposes time. The continuous flow of time thus exists independently of all motion, even though we only come to know time through those movements. It was another step, after Gerard Odonis and Buridan, in the direction of an absolute Newtonian conception of time. Telesio applied the same reasoning to the question of space, with the same conclusion.⁸

Telesio's latter conclusion was shared by the Platonist Francesco Patrizi. With regard to time, however, Patrizi remained closer to Aristotle, in spite of his anti-Aristotelianism, for he argued that time

⁸ Kristeller, *Eight Philosophers of the Renaissance*, pp. 98 and 103. Cf. Cassirer, *Das Erkenntnisproblem*, Part I, pp. 258–260. Kristeller points out that Telesio rightly uses the word *spatium* instead of *locus* for the pre-given, receptacle-like space: *ibid.*, p. 175, n. 7. See too K. Schumann, 'Zur Entstehung des neuzeitlichen Zeitbegriffs', and C.H. Leijenhorst, 'Bernardino Telesio. Neue Grundprinzipien der Natur' in Blum (ed.), *Philosophen der Renaissance*.

only arises after or with motion, and motion only after and with things.⁹ But he did not hold that time is the measure of motion, nor that it has anything to do with our thinking; rather, time is the duration that is associated with things.

The views of the much younger Tommaso Campanella were also of great interest. Although the Inquisition kept him in prison for almost thirty years, he produced a large and influential oeuvre. Like Telesio, Campanella was from Calabria, and his views were very close to those of Telesio in many respects. For instance, Campanella adhered to the theory of the three principles (heat, cold and matter), and he also defended an epistemology with an empirical slant and believed in the absoluteness of space as a necessary basis for mathematics and physics. Like Patrizi, however, he did not believe in the absoluteness of time. Time, in his view, was essentially connected with things. Although he emphasised—following Telesio—the reality of time and its independence from any subjective element, he did not do so on the grounds that time was independent of things and of their changes. On the contrary, Campanella considered that time could not exist independently of them, because for him, as for Patrizi, time was the duration of things, which in their mutability have a beginning and an end. That is why time became the dimension of the thing itself by virtue of its mutability.¹⁰

So the Renaissance philosophy of time extended over a wide spectrum with two extremes: the view of the Neoplatonists that time is something that is essentially connected with the soul; and the objectivist and emphatically non-mentalist views. The latter, though, differed on whether time could or could not exist independently of material things and their movements. The space in between was occupied mainly by Aristotelian positions that shared elements of both the mentalist and the objectivist view.

The power of time was not in doubt in any of these discussions. It is true that time still lacked the impressive infinity that was gradually attributed to space from the middle of the sixteenth century. The interventions of Copernicus, Giordano Bruno, Kepler and Galileo

⁹ *Tempus enim post motum vel cum motu est, motus post corpora et cum corporibus*, cited by Kristeller, *ibid.*, p. 177 n. 25.

¹⁰ See Bernardine M. Bonansea in *The Encyclopedia of Philosophy*, Vol. 2, p. 12. Cf. Cassirer, *op. cit.*, Part I, pp. 255–257.

in those years brought about the slow but sure demise of Aristotelian cosmology. Space lost its traditional finitude. Time, on the other hand, was clearly delimited by the bible with a beginning and an end. In between that beginning and that end, however, time reigned supreme: it determined life and death, growth and decay, according to the claim that Stephen Hawes put into time's mouth. Time was the destroyer par excellence, but was also the condition of any renewal. Everything that took place did so in time, and that alone was enough to make it the optimal revealer: 'time, which reveals all other things', as John Locke was to write.¹¹ But time also revealed human frailty. This was an important theme in the essays of Montaigne. In diametrical opposition to the ideas of Ficino and Giovanni Pico, Montaigne emphasised the human shortcomings. Although for a while, in an attempt to elevate himself above the vicissitudes of events, he still adhered to the ideals of a Stoic attitude towards life, from a certain moment on he conceded defeat. His *Apologie de Raymond Sebond* is in essence a long litany on human frailty. In it Montaigne draws attention to the uncertainty of our knowledge and therefore defends the desirability of not believing anything; he treats the reader to a variegated survey of mutually contradictory philosophical opinions. The senses, he claims, are arbitrary and unreliable, our judgments are only too often dependent on our mood, and intellectual speculations are worse than useless.¹² But to bring out the vagueness of the line separating humans from animals, this sceptic appealed to the most improbable stories about striking examples of animal insight and behaviour.

The final pages of this *Apologie*, in phraseology that is largely borrowed from a French translation of Plutarch, provide an eloquent picture of our subordination to time.¹³ Permanence is not our fate. It is the destiny of all things to undergo one change after another, and the human intellect is incapable of finding anything permanent in that: 'For Time is a thing of movement, appearing like a shadow

¹¹ Locke, *An Essay concerning Human Understanding*, II.XIV.2. On time as the revealer of truth (*Veritas filia temporis*, as a popular adage put it) see above, p. 117.

¹² Earlier in the same essay he makes fun of those who have spoken of mountains and valleys on the moon and who have speculated on the inhabitability of this celestial body (*Essays*, p. 505). Soon afterwards (in 1610), Galileo was to establish those ideas on a firmer footing thanks to his observations through a telescope.

¹³ *Essays*, pp. 678–680.

in the eternal flow and flux of matter, never remaining stable or permanent; to Time belong the words *before* and *after*; *has been* and *shall be . . .*'¹⁴ However reminiscent of Plato this may appear, Montaigne's moving shadow is not the shadow of eternity, and it is only with divine help and divine mercy that we might be able to rise above time.

That people are not able to bend events to their will is a recurrent motif in Montaigne's essays. However natural it may be, the attempt to control the future is essentially futile.¹⁵ 'Unable to control fortune, he abandons himself to her' is how Quinones characterises Montaigne's attitude.¹⁶ So in this world it is best to observe the existing practices. Montaigne even adopts the extremely conservative position that in public affairs every old custom is better than any innovation,¹⁷ as long as one does not suppose that one's own familiar customs are better than customs elsewhere.

In his personal and of course unique way, Montaigne represents a stage in the development of the sense of time. The process continued. The effects of the disenchantment of the world began to be felt more widely and the world was no longer related in the same way to eternity. Panofsky characterised the position of the Baroque in this respect as extreme: '[. . .] no period has been so obsessed with the depth and width, the horror and sublimity of the concept of time as the Baroque [. . .]'.¹⁸ It may be somewhat exaggerated, and in any case: Who will decide? But the tangible evidence is there, in word and image.

Despite what Montaigne's ideas might lead one to believe, the struggle was not abandoned. New attempts were made to control time. An interesting variant was formed by all kinds of new visions of world history. This is investigated and described for a number of leading English writers in the fine study by Achsah Guibbory, *The Map of Time: Seventeenth-Century English Literature and Ideas of Patterns in History*. Guibbory shows that such visions were not just the products

¹⁴ *Essays*, p. 682.

¹⁵ *Essays*, I.III: 'Our emotions get carried away beyond us'.

¹⁶ Quinones, *The Renaissance Discovery of Time*, p. 211, esp. in connection with 'On presumption'.

¹⁷ *Essays*, p. 134.

¹⁸ Panofsky, 'Father Time', p. 92. On the obsession with time in the age of Baroque see also André de Laet, *Nu is er ook toen*, ch. 4.

of a desire to learn from the lessons of the past, but were also attempts to shake off time and to rise above it by means of an all-embracing panorama. They were human alternatives to eternity, to the surveying of time from a static moment. The content of those visions might vary: sometimes the decisive component was universal decay, sometimes eventual progress, sometimes a cyclical structure or a pattern derived from the bible. In each case, however, its function as a timeless survey of time was the same, and some of those involved were aware of the fact. Spatial metaphors like those of Sir Thomas Browne ('the map of time', chosen by Achsah Guibbory for the title of her book) and Sir Walter Raleigh ('the vast and devouring space of so many thousands of years') are illustrative of this ambition of setting oneself outside time in order to be able to survey time.¹⁹

Towards the end of the seventeenth century the idea of progress seems to have won pride of place among these panoramic images of time. This has also been argued by Paul Hazard in his famous book *La crise de la conscience européenne*. Respect for the past is overshadowed by the modern era and the future, and the ideal of progress emerges.²⁰ And for many it is not long before progress has become not just an ideal but a doctrine too.

¹⁹ Achsah Guibbory, *The Map of Time*, Introduction, esp. pp. 2–3.

²⁰ Hazard, *La crise de la conscience européenne*, I.2 and III.6.

CHAPTER ELEVEN

DURATION AND ABSOLUTE TIME: DESCARTES, SPINOZA, LOCKE, NEWTON

All in all, for some three hundred years the problems of time were less prominent in philosophy than they had been in the years around 1300. The developments of the sense of time in the fifteenth and sixteenth centuries were drastic enough and of course they had philosophical implications, but played a smaller role in the philosophy of those years than one might expect. That changed in the course of the seventeenth century, especially under the influence of Galileo. John Locke's *An Essay concerning Human Understanding* was a new milestone in the history of the philosophy of time. It coincided almost exactly with another influential event: the introduction of absolute time by Newton in his *Philosophiae Naturalis Principia Mathematica*. From now on time is back in force as a major theme in the work of leading philosophers. Locke's great predecessors Descartes and Spinoza had already set the ball rolling.

Descartes concentrated on time particularly in the first part of his *Principia Philosophiae* of 1644, where he introduced time via duration (*duratio*) in three stages. The first step is that we may have a clear idea of the duration of a thing when we consider that thing in so far as it continues to exist. The intellect distinguishes between this continuation and the existence in itself, although in reality they are both indissolubly intertwined.¹

The second step is the insight that duration is a general and shared property of all things, which entitles us to say that it is an attribute of the substances involved.² The question arises of whether this is always the same attribute, or whether it varies from one substance to another. The Cartesian world of created things consists of two separate substances—matter and mind—and since he had just said that we can only have a clear idea of these two substances if we

¹ Descartes, *Principia Philosophiae*, I.55; cf. I.62.

² *Ibid.*, I.56.

keep all the attributes of one separate from those of the other,³ it seems difficult to adduce the same attribute for both. And indeed, in the first case time depends on extension, while in the second case it depends on thought; they, after all, are the essential attributes from which all others are derived.⁴ All the same, Descartes does not explicitly draw a distinction between the two categories of created things when he refers to duration as one of their attributes,⁵ so he probably intended the identity of the attribute to be assumed. The distinction that he called for earlier was thus only necessary to maintain one substance clearly distinct from the other in thought.

The case is different for the only *uncreated* substance, God. Already the term 'substance' itself does not apply to God in the same way as to matter and mind,⁶ and it follows from this that his attributes may not be taken to be equivalent to the attributes of the created substances either. One of these attributes is duration, for in Descartes' conception God too continues to exist. Unlike the duration of created things, however, the duration of God is unlimited, since God is eternal.⁷ Nor is God dependent on anything else, since God is his own cause and, unlike all created things, does not require something else for his continued existence. Thus for Descartes duration can be broken down into at least two attributes: one for the created substances, and one for the uncreated substance.

It is the third step that brings us to time proper. Following Aristotle, Descartes describes time, albeit only in passing and perhaps merely to remind his readers of this definition, as the measure of motion. More important, however, is that for Descartes time is the measure of duration of all things as he has already described and defined it. More in particular, time is based on the comparison of any duration with the duration of the regular diurnal and annual celestial movements. This means that there is an essential difference between the ontological status of duration and that of time. While duration exists in and with things and can only be detached from them in thought, time (in so far as it differs from duration, for the latter, of

³ *Ibid.*, I.54.

⁴ *Ibid.*, I.53.

⁵ *Ibid.*, I.56.

⁶ *Ibid.*, I.51.

⁷ *Ibid.*, I.14 and I.22.

course, is contained within time) is merely a mode of thinking (*modus cogitandi/une façon de penser*).⁸ While duration is extracted from things by thought, as it were, time is added to them by thought.

In more than one respect this recalls the position of Ockham, for whom the distinction between motion or rest, on the one hand, and time as the measure of that motion or rest, on the other, is an intellectual distinction. An important difference is that Descartes' view is incorporated in his doctrine of the substances. Full scope is given to space in that doctrine, if only because three-dimensional extension is the essential attribute of matter. In Part II of the *Principia*, extension, place and space are therefore discussed in considerable detail. Movement is there described as a transference in space, defined as 'the transference of one part of matter or of one body, from the vicinity of those bodies immediately contiguous to it and considered as at rest, into the vicinity of [some] others'.⁹ So movement only applies in relation to vicinity. Of course, something may be involved together with its surroundings in a combined movement, but that is only the movement of the whole, not of a part. The notion of this relative movement, which constitutes true movement for Descartes, is the opposite of movement 'in the ordinary sense', which Descartes had discussed in the previous section and described as 'an action by which some body travels from one place to another'.¹⁰ He had argued that this ordinary notion of movement leads to arbitrary conclusions, precisely because of the number of accumulated movements. Of course, not just movement as commonly interpreted but genuine movement too can proceed faster or slower, which implies time at any rate. However, Descartes fails to elaborate this, even though he presupposes a quantitative notion of speed. This can be seen in particular when he introduces the notion of 'quantity of motion' as the product of speed and 'quantity of matter', the latter understood as the relevant volume. The sum of these products for all existing bodies is taken to be constant.¹¹ This is followed by the formulation of several natural laws, of which the first two stipulate the modern prin-

⁸ *Ibid.*, I.57; cf. also I.21.

⁹ *Ibid.*, II.25.

¹⁰ *Ibid.*, II.24.

¹¹ *Ibid.*, II.36.

ciple of inertia and the third is a remarkably incomplete and incorrect treatment of collision.¹²

With all that, the role of duration in the Cartesian system is important because it is an attribute of *all* substances: of matter and mind, and in a different way even of God. Duration extends to all things.¹³ Although it is a secondary attribute (unlike spatial extension), it is very directly recognisable as such: as far as the mind is concerned, in every thought process; as far as matter is concerned, in motion and rest; and as far as God is concerned, in the notion of his uninterrupted and continuing existence. Time too is implicated with the two created substances, though in a more complex manner. It is connected with matter and mind via duration, but it only applies to matter by virtue of the mind, and only applies to the mind by virtue of matter. After all, the mind is necessary to constitute time in matter through comparison with the regular celestial movements, while the duration of what goes on in the mind can only be measured, in whatever way, by material movements. On the other hand, it may be supposed, for Descartes time is not applicable to God. Because of his unchangeable eternity, his duration is immune to the measures of the regular material movements.

So the notion of time in Descartes leads to interesting problems concerning the relation between the substances. What is certain in all this is that the mind is essential to time. On Descartes' definitions, there can be no time without thought. Moreover, the mind is involved in the recognition of duration too, not only because only the mind can be aware of something, whatever that something may be, but also because we cannot become aware of the duration of a material object if our thought has no duration. We can only experience progression if our mind continues to exist. That does not alter the fact that there would still be duration without the mind, but in that case there would be no time. And not just that: there would be no time either if there were no matter, since it is only from matter that a measure of time can be derived. The mind in itself has duration, but only produces time by means of matter. However, Descartes does not go any further into these questions.

¹² *Ibid.*, II.37–44.

¹³ *Ibid.*, I.48.

In 1663 Spinoza published a deductive adaptation of part of Descartes' *Principia Philosophiae*, namely a number of chapters from Parts I and II, and something from Part III. He did so with the comment that he by no means agreed with everything in this work. The terms 'duration' and 'time' do not play a role of any importance in this adaptation, but the situation is different in the Appendix with the so-called *Cogitata Metaphysica* (*Metaphysical Thoughts*). Here too he did not in principle give his own views, but focused on the views of the late Scholastics in combination with the ideas of Descartes. Nevertheless, Spinoza's own thought is repeatedly expressed here.

Unlike Descartes, Spinoza draws a strict distinction between eternity and unlimited duration. Eternity is not a form of duration, he argues, but something entirely different. It only extends to God because in his case existence is a part of essence (God is the cause of himself, *causa sui*), while duration extends to the created things, whose existence is not necessarily a part of their essence. Only in the latter case does existence have a duration, even if that duration has no beginning or end and is thus unlimited. God, on the other hand, exists outside any duration. Prior and posterior, shorter or longer in time do not apply to him.¹⁴ Like Descartes, Spinoza determines the duration of something by comparing it with the duration of permanent and determinate (which probably means 'regular' here) movements. Such a comparison transforms duration into time. Spinoza puts it very succinctly: this comparison *is* what we call time.¹⁵ Time therefore has no real existence. It is a mental thing, a mode of thinking (*modus cogitandi*).¹⁶

We can gain a less ambiguous picture of Spinoza's own views from his letter on infinity to Lodewijk Meyer, the man who prepared Spinoza's adaptation of the *Principia* for publication. This letter, dated 20 April 1663, is from the same period. In this letter Spinoza links eternity to substance and duration to its modes. Substance (there is only one substance for Spinoza) has an existence that is a part of its essence. The definitions of the modes of this one substance, on the other hand, do not necessarily include their existence. Hence the existence of these modes has a duration. Time is instru-

¹⁴ Spinoza, *Cogitata Metaphysica*, I.4 and II.1.

¹⁵ *Ibid.*, I.4.

¹⁶ Cf. also *ibid.*, I.1.

mental in determining duration, and in such a way that we can easily imagine that duration. Time is thus a mode of thinking, or rather, of imagining.¹⁷ One should bear the consequences of this firmly in mind, Spinoza continues. Not only are such aids to the imagination, which include measure and number as well as time, useless for a proper understanding of substance and eternity, which can only be understood by the reason, but they must not be confused with the modes either. 'For by so doing we are separating them from Substance and from the manner of their efflux from Eternity, and in such isolation they can never be correctly understood.'¹⁸ In short, time belongs to the world of our imagination, while duration has real existence, independently of us, as issuing from eternity.

Spinoza was already composing his *Ethica* at this time, although the work was only published posthumously in 1677. It is therefore hardly surprising that the central ideas from his letter of 1663 recur in the *Ethica*. Thus eternity is defined as belonging to what necessarily exists.¹⁹ The passages referred to above from the *Cogitata Metaphysica* are also related to the *Ethica*, partly because, unlike his views on eternity, Spinoza's vision of duration and time remained Cartesian. While thought and extension have become attributes of the single divine substance for Spinoza, he concurs with Descartes in defining duration as the 'indefinite continuation of existing'.²⁰ Time is not explicitly defined in the *Ethica*, but that it is still the measure or determination of duration can be seen from the proofs of a couple of propositions in Part V, the last part of the *Ethica*. After it has been posited in Proposition XXI that 'the mind can imagine nothing nor recollect past things save while the body endures', Proposition XXIII claims that a part of the human mind is eternal. In the accompanying proof it is noted that it is only because of its involvement with the body that the human mind comes into contact with duration and time, of which (here it comes) the former is determined by the latter. In essence mind must be eternal. This relation between duration and time in connection with the body recurs in the proof to Proposition XXIX. Spinoza says nothing more on how the

¹⁷ Spinoza, *Briefwisseling*, p. 123; *Letters*, p. 104.

¹⁸ *Briefwisseling*, p. 124; *Letters*, p. 104.

¹⁹ Spinoza, *Ethica*, I, def. 8.

²⁰ *Ibid.*, II, def. 5.

determination of duration by time proceeds, but it is natural to suppose that on this point he still followed the account in the *Cogitata Metaphysica*.

So for Spinoza, unlike for Descartes, a part of the mind is outside duration and time. And on the basis of the propositions mentioned above, Spinoza even claims that, by virtue of that part of the human soul that is eternal (a part whose size is in proportion to the capacity of the body, according to Proposition XXXIX), the body too can be regarded *sub specie aeternitatis*. This is the route that can eventually lead to knowledge of God.

Duration and time are discussed more fully than by Descartes and Spinoza in John Locke's *Essay concerning Human Understanding*. Dated 1690, it actually appeared at the end of 1689. Locke had been working on it for eighteen years. Duration and time are dealt with in detail in Part II, Chapters 14 and 15. His argument is, of course, radically different from that of his two predecessors, but there are also striking points in common.

Like Descartes and Spinoza, for example, Locke starts with duration and derives time from that. And like Descartes he was very interested in the foundation of our knowledge. However, since he denied the existence of innate ideas and considered that the mind could not arrive at knowledge by itself, he held that all our ideas are based on experience. That experience, he claims, starts with simple perceptions. After that, however, there are a good many possibilities. The mind can also experience composite ideas; it can even produce them by itself. Generally speaking, it can form new ideas by reflecting on ideas that have already been acquired, starting with perceptions.

A controversial category in this connection is formed by general or abstract ideas, the opposite of particular ideas. They correspond to general properties and types of things or events, the best-known example being the general triangle. They are controversial in terms of the notion in itself (how can these abstract ideas exist?) and because of the enigmatic nature of what Locke has to say about them. He calls them 'fictions and contrivances of the mind', which as such have a difficult genesis and are difficult to grasp. The crux is the passage in which Locke says of the general idea of the triangle that it is neither rectangular nor oblique, nor equilateral, isosceles or scalene—but all of this at the same time. 'In effect, it is something

imperfect, that cannot exist; an idea wherein some parts of several different and inconsistent ideas are put together.²¹ This looks disastrous, but Locke has been protected against himself. John Mackie, for example, has argued that in this section ‘Locke was carried away in a dramatic exaggeration of the difficulties of abstraction’. The same scholar considers that the core of Locke’s view, as he formulated it elsewhere in the *Essay*,²² is not at all paradoxical, and is in fact extremely convincing. He takes it to boil down to the view that abstract ideas are created by selective attention to certain properties, aided by resemblances and comparisons.²³

This should serve as a background to Locke’s analysis of duration and time. Duration, on Locke’s view, is an idea formed in reflection. In reflecting on our ideas, we note their succession, and we perceive a certain distance in that succession. In that way, and in that way only, we form an idea of duration. Movement plays no part in this. Locke does not mention the role of memory; he had already written about it in the chapter ‘Of Retention’, where he had broken retention down into contemplation and memory. Contemplation implies duration, while memory seems to be implied in any perception of duration, since it is necessary for the ability to perceive succession and is thus essential to the reflection at issue here. But just as Descartes had forgotten the duration of the mind as a condition of the perception of progression, so Locke forgot memory as a condition of the perception of succession. It does not appear until the end of Chapter XIV, in section 28. Long before then, Locke had already concluded: ‘That we have our notion of succession and duration from this original, viz. from reflection on the train of ideas, which we find to appear one after another in our own minds, seems plain to me, in that we have no perception of duration but by considering the train of ideas that take their turns in our understandings.’²⁴

²¹ Locke, *Essay concerning Human Understanding*, IV.7.9; cf. II.32.6–8. Of course, this view has been repeatedly commented on and criticised. See, for example, the relevant articles in the collection *Locke and Berkeley* edited by C.B. Martin and D.M. Armstrong, and further esp. E.W. Beth, ‘The Problem of Locke-Berkeley’ in his *Aspects of Modern Logic*, pp. 42–62.

²² *Essay*, II.11.9.

²³ Mackie, *Problems from Locke*, ch. 4, sections 1 and 2, esp. pp. 110, 114, 116. R.I. Aaron had remarked that Locke only intended to say that the general triangle represents all sorts of triangles without being one of them; see his *John Locke*, pp. 195–207. Cf. Kenneth P. Winkler, *An Interpretation*, pp. 49–52.

²⁴ *Essay*, II.XIV.4.

And at the end of this section (the fourth), he repeated it again: without the observation of the succession of their ideas, ‘men can have no notion of duration, whatever may happen in the world’. That memory is crucial to this is left unstated for a long time.

It might be supposed that the origin in succession is sufficient to make the idea of duration a composite idea, but that is not the case. Duration does consist of parts, but they all share the same form, so that the idea of duration, like that of space, is simple.²⁵ Is it abstract as well? Given its general applicability, that is what one would expect. This would also be in line with Mackie’s criterium of selective attention, since the idea of duration is the outcome of reflection on our ideas by virtue of their succession. Moreover, in his introductory comments Locke states that duration, time and eternity ‘are, not without reason, thought to have something very abstruse in their nature’.²⁶ But that is not really borne out in the case of duration. Nor does the notion that duration is an abstract idea accord with Locke’s account in section IV.VII.9, where the artificiality of abstract ideas is emphasised and the general triangle with its paradoxical properties serves as prototype. It is thus impossible for a simple idea to be an abstract idea, and duration must therefore be a particular idea, an idea of a specific, individual entity. And indeed, everything seems to point to Locke’s having held duration to be unique: every time one experiences duration, one experiences a piece of one and the same duration.²⁷

As in the case of Descartes and Spinoza, this duration is not yet time. For Locke too, time is based on a comparison and measuring of durations, i.e., fragments of duration. Once again, time is the measure of duration and our ideas are the foundation of this. As the ‘measure’ of all things, ideas are also the ‘measure’ of every measure, and thus also the ‘measure’ of duration, i.e. time. It is ‘the constant and regular succession of *ideas* in a waking man’ that serves as the measure of all succession.²⁸ Locke realises that this can only take place if the world presents us with a series of events (not necessarily movements) that are equally long in our experience. It is

²⁵ Ibid., II.XV.9.

²⁶ Ibid., II.XIV.2.

²⁷ This emerges most unambiguously in section II.XV.11.

²⁸ Ibid., II.XIV.12.

only by means of such a series that the comparison of fragments of duration can be effectively regulated. After all, separate periods cannot be directly compared with one another, and there is no movable measure available as there is in the determination of spatial dimensions. So such a comparison of fragments of duration can only be carried out indirectly, by means of a unit in the external world that repeats itself. It can therefore only come about when a periodic process takes place in the world that yields a unit we hold to be reliable. 'Nothing then could serve well for a convenient measure of time, but what has divided the whole length of its duration into apparently equal portions, by constantly repeated periods.'²⁹ Of course, that reliability is not definitive, and time will perhaps never determine duration exactly, since for Locke it is always capable of improvement.

This argument has the remarkable implication that duration is already characterised by regularity independently of the measure of time available. We measure duration with time, it is true, but without time we apparently already know that duration proceeds regularly! Locke even says so in so many words: 'Duration, in itself, is to be considered as going on in one constant, equal, uniform course'.³⁰ In the end, this regularity is the norm for the precision of time. This illustrates once again the fundamental importance of the idea of duration, and in other respects it recalls that striking feature of Newton's notion of time that has already been mentioned in Chapter I. His major work, to which I shall shortly return, was published a few years earlier, in 1687. But it can already be stated now that what Locke calls the regular course of duration corresponds to what Newton calls the even flow of mathematical or absolute time. Nor can there be any doubt that what Locke calls time corresponds to Newton's relative time.

Once we have a measure of time at our disposal, Locke claims, there is no longer any limit on its extrapolation forwards and backwards. We can project it into the future or into the past, and in both directions beyond the period in which the original process that has provided us with time is situated. That is, we can project time backwards in our thoughts to before the sun existed, even before

²⁹ *Ibid.*, II.XIV.18.

³⁰ *Ibid.*, II.XIV.21.

the start of the creation (according to Locke that took place considerably earlier), and we can project time forwards to beyond the moment when the world ceases to exist: 'we can, in our thoughts, apply this measure of a year to duration before the creation, or beyond the duration of bodies or motion'.³¹ We can do that in our thoughts and then talk meaningfully about it, albeit only because time is based on duration, since duration cannot have a beginning or end. We can therefore continue this application of time to duration without any limitation and thereby develop the idea of eternity as unlimited temporal duration. In fact, we are bound to do so, because we are driven to do so and have no choice. Time, as Locke sees it, like duration, has no beginning or end. He does not refer to eternity in the sense of timelessness or a permanent present.

The creation of the world took place at some point in time. Locke probably accepted the calculation that it must have taken place in 3950 BC.³² However, he considered it absolutely not pointless to talk about tens or hundreds of thousands of years ago, even though the world did not exist then and therefore nothing happened.

Can this Lockean time exist without mind? A first objection is that no measure of time can be developed, and thus no time can exist, unless there is an entity that can estimate that certain periods are roughly equal to one another. Such an entity presupposes intellectual capacity. But this argument is not yet decisive. After all, it might be objected that a periodic process with an implicit measure of time can exist without the need for a conscious being to notice its existence. It is even the case that, according to Locke, duration in itself already has an internal regularity. But that does not alter the fact that time, for Locke, is above all our time, the time that we have made ourselves by combining ideas in a certain way with one another. Others might do so in a different way. In fact, not all human cultures have done this in the same way, and if there is intelligent life elsewhere in the universe, it might produce, or have produced, time in yet another way. Although there is only one duration, in principle a plurality of times is possible. Each of them, including our own, is a 'contrivance of the mind'. That already points in the direction of abstract ideas, and indeed, as a composite of measures

³¹ *Ibid.*, II.XIV.25.

³² *Ibid.*; cf. also XIV.29.

that are individually applicable to distinct periods, time has to be conceived as an abstract idea. The hour, for instance, is a category. Perhaps *mutatis mutandis* Locke might have applied what he says about the general triangle to the general hour: it is neither pleasant nor unpleasant, calm nor exciting, but all of those things at the same time.

That is not true of duration, as we have seen, but that does not necessarily mean that duration can exist without mind. Although duration is not an abstract idea or 'contrivance of the mind', it is an idea—in fact, an idea that is dependent on reflection. On the other hand, however, this idea is an idea *of* something, namely of the regular course of duration. Although Locke believed that our ideas are the proper object of our knowledge, so that strictly speaking the extent of our knowledge is our own world of ideas, he was at the same time convinced that our ideas can correspond to reality. They are a reliable reflection of the really existing and objective external world. In this respect he was a realist, not an idealist, and certainly not a subjectivist. Seen in this light, there is thus every reason to regard the idea of duration as our knowledge of something that, in whatever way, is found in the objective, external world, namely uniform, unlimited, really existing duration.

This seems even clearer in the case of succession. The role of reflection is minimal here, because we perceive it as such almost directly. This is not affected by the fact that memory is required for this perception. Of course, in the first instance this perception only concerns the succession of our ideas, but that is no essential limitation of the phenomenon. Succession is also found in the external world, and Locke will not for a moment have seriously entertained the possibility that it only exists by virtue of our ideas and thus by virtue of the mind. In the question of dependence on the mind, this puts duration back between succession and time: not clearly dependent like time, but less clearly independent than succession.

Locke's position, however, is rather ambiguous in several aspects. No doubt that is partly due to the fact that his position is outlined with concepts that only acquired their present-day, strict definition later, in so far as they have acquired one at all. Seen in that light, it is not so surprising that his position on empiricism and rationalism, as well as on realism and idealism, is somewhat ambivalent. Still, that is not the only factor, and sometimes the ambiguity is not introduced from outside. For instance, his concept of substance, however

debatable it may be,³³ is extremely realist compared with other, more experience-related elements of his philosophy. This discrepancy is not an optical illusion resulting from the application of distinctions that were only refined later. It may be expected that, upon closer inspection, Locke's doctrine of time may display some of this ambivalence too.

That is indeed the case. For if the empiricist thrust of his main work is taken seriously, duration emerges as something that, strictly speaking, only exists in our minds. That we can perceive succession, indeed, that succession really exists, is then only because we have duration at our disposal in our minds. From this perspective, without our minds something like real succession could only have a latent existence at most, since it takes the mind to turn that potential into reality.

This consideration brings Locke closer to Descartes, who also presupposed the duration of the mind (though without stating it explicitly), but above all closer to Augustine. Locke does not refer to Augustine by name, but at the beginning of his own reflections on time and duration he refers to the answer of a great man to the question of what time is: as long as no one asks me, I know what it is . . .³⁴ Countless treatises on time have begun with that citation ever since. And like many of his successors, Locke leaves it at that as far as Augustine is concerned, even though his own view is in a certain respect so strongly reminiscent of that of Augustine that it would have been useful if Locke had compared his own views with those of his predecessor.

As was argued in Chapter VI, Augustine's characterisation of time as an extension of the mind provides an incomplete picture of what he thought, because for Augustine the superhuman world time also existed. In the same way Locke's duration, conceived as a dimension of mind, needs to be supplemented with a corresponding dimension of material reality. Locke is unwilling and unable to dispense with the latter. That time can only be effectively determined with the help of physical processes means at least that a physical duration is contained in those processes. The alternative to the placing of duration between succession (independent of mind) and time

³³ Cf. Mackie, *op. cit.*, esp. ch. 3.

³⁴ *Essay*, II.XIV.2.

(dependent on mind) that was described and argued above is thus the splitting up of duration into a mental and a physical component. This would bring Locke close to Augustine again.

Locke's view, however, is just as strongly reminiscent of that of Newton and his mentor Barrow as it is of the Augustinian one. In the lectures on geometry, which Newton edited and prepared for publication (under the title *Lectiones Geometriae*) in 1669, Isaac Barrow had argued that time as such, i.e. time according to its intrinsic and absolute nature, is independent of movement and rest, and of any event at all. It was not even affected by the creation of the world. Independently of all else, it flows on, without speeding up or slowing down. It depends on God alone. For like infinite space, infinite time is there thanks to God's everlasting omnipresence. In all other respects time and space are media, unaffected by anything, within which the world is created and everything takes place. They do not imply that a world exists, but make it possible for a world to exist.³⁵

With regard to space, a similar standpoint was defended by Henry More, who was also established in Cambridge. He belonged to the group of Platonists, but he was influenced by classical atomism and Stoic physics. On several occasions he wrote about the essence of space, which he regarded as infinite, omnipresent, everlasting, unique and indivisible. His conclusion was that space must be seen as the extension of God. Through the creation God filled a part of this space with matter, but space as a whole is not dependent on matter—it is matter that is dependent on space. In correspondence with Descartes, More tried to get the French philosopher to abandon his view that spatial extension is the essential attribute of matter. That would in turn lead to the collapse of Cartesian dualism. Descartes, however, was not impressed.³⁶

Barrow applied ideas like these not only to space but also to time. Moreover, he elaborated them scientifically. In doing so, he made a major contribution to the view that space and time are the

³⁵ For a presentation of Barrow's doctrine of time, with several lengthy citations, see E.A. Burtt, *The Metaphysical Foundations of Modern Science*, pp. 155–161; cf. Van Fraassen, *An Introduction*, pp. 22–23.

³⁶ On Henry More's views in this connection see Burtt, *op. cit.*, pp. 135–150, and esp. A. Koyré, *From the Closed World to the Infinite Universe*, pp. 110–154, where he summarises More's correspondence with Descartes. More was also convinced that there are spiritual forces in space that affect matter.

fundamental twin concepts, as they have remained ever since. This was not generally the case before that date, not even remotely for Descartes and Spinoza. Telesio, however, had taken a decisive step before them, which was adopted and further elaborated by Gassendi in a work that was published posthumously in 1658 (*Syntagma Philosophicum*). Gassendi stressed the parallelism of space and time as fundamental, independent and infinite magnitudes. He even suggested that infinite time is not different from eternity.³⁷

For Barrow too time, like space, was in itself unlimited and omnipresent. But although time was not dependent on matter nor more particularly on movement either, we need movements to measure it, because they alone can provide a suitable measure. Such a measure, according to Barrow, can only be the result of numerous comparisons. No single movement, not even that of the sun and the stars, is a priori a reliable measure.

Newton adopted Barrow's absolute notion of time, but without initially appealing to God in any way. His view is concisely presented in the famous passage in the scholium that follows the eighth definition in his *Principia* of 1687. Newton claims there that a distinction must be drawn between relative, phenomenal, conventional time, on the one hand, and absolute, true, mathematical time, on the other. The former, as it was for Barrow, is a more or less accurate measure of the latter. Absolute time, which Newton also called duration, flows evenly on by nature independently of anything outside it. And just as there is an infinite, absolute time, so is there an infinite absolute space, distinct from any relative determination of place.

Newton had specific arguments for this point of view. He argued that in respect of certain accelerated movements, particularly rotating movements, it could be shown that they not only took place relative to other objects, but that they were absolute. This could be deduced, he argued, from the concomitant effects. Take a bucket full of water that starts to rotate. When the water rotates along with the bucket after a while, it becomes somewhat hollow, although the water is then no longer moving relatively to the bucket. There is thus undeniably a centrifugal force at work and the rotation is appar-

³⁷ Cf. K. Schumann, 'Zur Entstehung des neuzeitlichen Zeitbegriffs', pp. 55–64, esp. 63.

ently a true, absolute movement. If the bucket suddenly stops rotating, the water still remains hollow for a while even though it is now in movement in relation to the bucket.³⁸ Likewise, if two spheres that are connected with one another by a piece of rope rotate together round their common centre of gravity, they are in rest in relation to one another, and yet tension will still arise in the rope. This rotation too is apparently absolute. There are thus absolute movements that can also be quantified, and that calls for not only an absolute space but also an absolute time.

Everything that takes place does so in this space and this time. The creation of the world must have taken place somewhere and at some time too. Vice versa, however, space and time did not need the creation in order to exist. In fact, space and time appear in Newton's system to even be completely independent of God. On the other hand, they themselves have pre-eminently divine properties such as infinity, eternity and omnipresence. These implications were given a warm welcome by a few. For instance, Joseph Raphson published a treatise on the divine properties of absolute space along these lines in 1702.³⁹ For many others, however, they were a ground for criticism. It was perhaps in connection with this criticism that in the second edition of his *Principia* (1713), Newton included in the general scholium a passage in which he derived duration and space from God: 'God is eternal and infinite, almighty and omniscient. [...] He exists for ever and is omnipresent; and by existing everywhere and always, he forms duration and space'. That was in line with Barrow and, at least as far as space is concerned, with Henry More too.

Absolute time does not need any other mind apart from the divine mind. The situation for relative time is different, for it cannot exist without an entity that perceives, compares, concludes and reflects, in short, without intelligent beings. Without them only absolute time exists. In this respect too, Barrow's and Newton's distinction between absolute and relative time corresponds to Locke's distinction between

³⁸ It is noteworthy that the relativity of a movement is here solely determined in relation to the direct surroundings. According to Julian Barbour, Newton is here engaged in a polemic with Descartes, who had said that movement in relation to the direct surroundings is *true* movement. See Barbour, *The End of Time*, pp. 61–67.

³⁹ Cf. A. Koyré, *op. cit.*, pp. 190–205.

the regular, strictly uniform duration and an only approximately reliable time. We need the latter in order to be able to carry out effective measurements of duration, where for Locke it is a question of approximating the uniformity of duration as closely as possible. For Newton too, relative time is indispensable, not only in everyday practice, but also as an experimental measure for mathematical, absolute time.

It is true that Locke does not establish any connection between God (whose existence he considered to be demonstrable) and duration, while on the other hand there is no question of any mental dimension of duration or time for either Barrow or Newton. It might be said that Locke attempts to explain our knowledge of unlimited, even duration without making use of the rationalist arsenal of innate ideas and without appealing to religious doctrines.

So Barrow and Newton are open to the same criticism as Locke: how can we know that absolute duration runs evenly, indeed, what does it mean to say that that is or is not the case? In fact, the notions of absolute space and absolute time were criticised right from the start. From Leibniz and Berkeley to Mach and Duhem, it was argued that we lack the means of determining absolute time and space, and that scientifically speaking there is no cause for regret because they are redundant.

CHAPTER TWELVE

THE CENTURY OF LEIBNIZ, BERKELEY AND KANT

Barrow and Newton had appealed to God as the source of absolute and unlimited space and time, but there was no longer any question of dependence on the minds of mortals. The human mind only plays a role in the production of *relative* space and time; there is no specific measure that is not selected and applied by somebody.

For Newton's great opponent Leibniz, space and time were pre-eminently relative magnitudes. He did not acknowledge the concomitant absolute, independent entities. He repeatedly denied their existence, most systematically at the end of his life, in the years 1715 and 1716, in his famous correspondence with Newton's advocate, the theologian and philosopher Samuel Clarke.¹

The absoluteness of space and time implies that the world, if it was created at a certain time in a certain place, could just as well have been created at some other time and in some other place. The question then arises of what can have led God to choose a specific time and place. According to Leibniz, however, the problem is not a problem at all, because such a shift in space or time is not a shift if you consider it properly. It is a meaningless idea, first because God would not have had a sufficient reason for his decision, and second because the result would not have made any difference at all. Or rather: there would not have been a sufficient reason precisely because it would not have made any difference. The two versions of the world would have been completely identical. Leibniz' principles of sufficient reason (everything that takes place has a sufficient reason why it takes place) and of identity through indistinguishability (it is impossible for different things to exist that are not distinguishable in their properties) interlock here. Thus the acceptance of absolute space and absolute time led inevitably to the conclusion that God could not have created the world in a certain place

¹ For a detailed study of this correspondence see Ezio Vailati, *Leibniz and Clarke*, ch. 4 discusses 'Space and Time'.

or at a certain time, and therefore that the world must be not only infinitely large but also infinitely old. That standpoint had been defended before, but for centuries it had not been considered theologically acceptable.²

Leibniz chose a different way out: according to him, space and time were not absolute, but were tied to things and their (potential) changes. In this respect, as far as time is concerned, he was following the tradition that had been established by Aristotle. Time required change before it could come into being, and time would disappear if nothing more were to happen. But for Leibniz time is not just the measure of change (in relation to prior and posterior); it also contains succession itself. In Leibniz' words, it is an order of successions, as space is an order of coexistences. That was why neither of them could exist without things, at least not in the full, actual sense. Without things, they both exist only as ideal possibilities in God. He formulated it in the fourth letter as follows: 'But if there were no creatures, space and time would be only in the ideas of God'. And in the fifth and last letter: '[. . .] I have demonstrated, that time, without things, is nothing else but a mere ideal possibility'.³ But what in that case would exist as possibility in the ideas of God is still the possible ordering of possible successions.

Leibniz too was convinced of the omnipotence and omniscience of God. He even accused Newton of holding them in too low esteem because Newton had concluded that God would regularly have to adjust the machinery of the cosmos. This accusation, moreover, was the main pretext for the correspondence with Clarke. Still, this cannot be seen as a hidden concession to Newton's absolute time and space, for time and space without things are inconceivable, and thus their creation was beyond the capabilities of God too.

Another passage in the fifth letter is less clear. Leibniz recognised that there is a difference between a relative change of place in relation to another object, on the one hand, and the absolute movement of a body, on the other.⁴ Clarke's triumphant reaction to this is understandable, but it was premature, for there is no doubt that Leibniz took this 'absolute' movement to be a movement of things

² Ibid., pp. 122–124.

³ H.G. Alexander (ed.), *The Leibniz-Clarke Correspondence*, IV.41 and V.55.

⁴ Ibid., V.53.

in relation to one another, and thus a form of relative movement, albeit no arbitrarily chosen relative movement. In particular, he held that movements have that absolute character when their immediate cause lies in the moving object itself. Much earlier Leibniz had already defended the thesis that only the force on which a movement is based can confer on that movement a more than merely relative character.⁵ In all probability, then, Leibniz' absolute movement differed from Newton's absolute movement, just as his notion of relativity was different from Newton's.⁶ He died before he could reply and was thus no longer able to explain exactly where that difference lay. It is of course conceivable that he had no convincing reply available, but he certainly did not need to fall back on absolutism à la Newton.

Leibniz may have believed that the foundation of what *he* understood by the term absolute movement was situated in things, but it is questionable whether that made time in general independent of the mind. A key passage here is his formal definition of 'simultaneity', 'before' and 'after' in his treatise on the metaphysical foundations of mathematics. He started out from the concept of compatibility, on the basis of the consideration that in every change at least one property is replaced by a non-compatible property. Simultaneous situations are then situations that are compatible in the fullest sense. He defines the difference between 'for' and 'after' in relation to non-simultaneous situations in terms of 'cause' or 'ground': a situation *a* precedes a situation *b* when *a* contains (a part of) the cause or ground of *b*, or is simultaneous with a situation *c* that contains (a part of) the cause or ground of *b*.⁷

So time is not a substance or a property of a substance, but a relation of ordering, namely between non-simultaneous situations. As such it belongs to thought as an *ens rationis*, more in particular an

⁵ Cf. Daniel Garber, 'Leibniz: Physics and Philosophy', in Jolley (ed.), *The Cambridge Companion to Leibniz*, pp. 270–352, esp. pp. 301–309. However, Leibniz had recognised that this force, that God must have placed in things, is unknowable; cf. *ibid.*, pp. 289–301. For a briefer account, see Vailati, *op. cit.*, pp. 131–132. Berkeley drew a different distinction between 'true' or 'genuine' and 'apparent' relative movements in his *Treatise concerning the Principles of Human Knowledge*; see below, p. 158.

⁶ Cf. Gernot Böhme, *Zeit und Zahl*, pp. 196–206.

⁷ Of course this is an incomplete presentation in which important nuances have been omitted. For a clear summary with some critical comments, see Van Fraassen, *An Introduction to the Philosophy of Time and Space*, pp. 35–44.

abstraction. Nevertheless, it appears to be embedded in the world: although the mind is required to determine it, its determinability is objectively given.

Problems arise, however, if we ask ourselves how Leibniz conceived of the world, and more in particular what the situations are that are mentioned in his formal definition. Sometimes he has physical situations in mind, and the connection between them is a form of physical causality. From this perspective Leibniz becomes the founder of the causal theory of time. At important points, however, he apparently refers to the situations of a soul, a monad. This is where his doctrine of the monads comes into play. This doctrine holds that the only real substances are souls or monads, which (although they are linked to a body) are closed off from the external world and whose conditions nevertheless reflect the entire universe more or less clearly. In that case, the definition states that a monadic situation that is sufficient ground for another (or is directed towards another) is prior to that other. Compatible situations of different monads can be regarded as simultaneous by virtue of their reflection of the same universe. In this connection, physical situations become mere phenomena that present themselves to the monads, and the temporal relations between them are derived from the temporal relations between monadic situations.

The question is complex and has given rise to a diversity of interpretations. To start with, it is not necessarily desirable to relate all aspects of Leibniz' philosophy to one another, and besides, when that is done the results may still vary. If one takes the monadological basis of Leibniz' philosophy of time seriously, however, his notion of time will be unable to evade dependence on mind in the end.⁸ Conceived in this way, his doctrine of time loses its causal character as well and becomes a precursor of the far-reaching mentalism of Berkeley's and Kant's views of time.

However, little of this is to be found in Leibniz' commentary on Locke in his *Nouveaux Essais sur l'Entendement Humain*. This commentary takes the form of a dialogue between Philalethes and Theophilos,

⁸ Cf. the concise account by Benson Mates in: *The Philosophy of Leibniz*, pp. 227–235. Much more detailed is Richard T.W. Arthur, 'Leibniz's Theory of Time', in Okruhlik and Brown (eds), *The Natural Philosophy of Leibniz*, pp. 263–313. See also Blattner, *Heidegger's Temporal Idealism*, pp. 263–264.

in which the latter is the spokesman for Leibniz' views. He denies the possibility of a determinate period in which there is no change. Locke's notion of duration allows, for example, that two successive worlds between which nothing happens can have a determinate distance in time, but Theophilus denies that anything meaningful can be said on that score. He rejects the succession of our perceptions as the foundation of time, because this experience only affords us the opportunity of thinking about time, but time would still exist in reality without it and even without periodic natural movement.⁹

The picture changes when we come to George Berkeley, whose views differ not only from those of Leibniz but also from those of Locke, by whom he was nevertheless clearly inspired.

Berkeley calls all ideas 'perceptions'. Their existence means that they are experienced, and this takes place in and through the mind (also referred to as 'spirit', 'soul' or 'myself'). So-called sensory perceptions happen to us whether we want it or not, but the perceptions of emotion, reflection, recall and imagination are partly the products of our own activity. All these ideas or perceptions are concrete, because Berkeley does not believe in the existence of abstract ideas. Our general words have to cope without corresponding abstract ideas; at most they can be linked to particular ideas. Still, it is the case that particular ideas can acquire a general character by means of a general application: '[. . .] an idea, which considered in itself is particular, becomes general, by being made to represent or stand for all other particular ideas of the *same sort*'. Parallel to this, words that originally belong to a particular idea are made general when they are used to refer to other ideas of the same sort.¹⁰ By the way, Berkeley does consider abstraction to be possible in a particular way, namely through the isolation from a complex whole of a part or aspect that can also exist independently, that is, can be experienced in itself. But that does not lead to abstract ideas in the Lockean sense.¹¹

⁹ *Nouveaux Essais*, in connection with Locke's *Essay*, II.XV.11 and II.XIV.16.

¹⁰ Berkeley, *A Treatise concerning the Principles of Human Knowledge*, Introduction, section 12; cf. also sections 13–16 and passim. For a critique of the inadequacy or even irrelevance of Berkeley's account of general ideas, see Mackie, *Problems from Locke*, p. 120.

¹¹ Cf. M.C. Beardsley, 'Berkeley on Abstract Ideas' in Martin and Armstrong (eds), *Locke and Berkeley*, pp. 409–425; G. Pitcher, *Berkeley*, ch. V; and Kenneth P.

Besides concrete or particular ideas, there are only minds that have these ideas. Minds cannot themselves be perceived. They exist through perceiving, that is, by having ideas or perceptions. While Locke had explicitly kept open the possibility of non-perceiving minds, for example sleeping or unconscious minds,¹² Berkeley denies their existence. 'Being' is thus perceiving or being perceived. There are passages which indicate that a mind can also exist by willing something, but this is not really a correction because for Berkeley willing is only possible if the mind concerned has a purpose in view and thus has a perception.

Berkeley already defended these theses in a work that he wrote as a young man, *A Treatise concerning the Principles of Human Knowledge*. This, his major work, was published in 1710. It was intended as the first part of a larger work, but no later parts were issued, although Berkeley did publish a revised, second edition in 1734. It is remarkable to what extent Berkeley regards the theses outlined above as self-evident; he claims repeatedly that everyone will immediately assent to them from common sense. Like his predecessor Locke and his successor Hume, he revels in the expression 'it is evident'; the first sentence of his *Principles* (in the 1734 edition) is such a blast. The argumentation is therefore often rather summary by comparison with the revolutionary conclusions. Among those conclusions, for example, is the claim that matter (material substance) does not exist. What is considered to be a material object is in fact, according to Berkeley, a cluster of perceptions.¹³ Its objective and uninterrupted existence is only guaranteed by the existence of God as the mind that lasts for ever and registers, creates and maintains everything. God is the only infinite mind among the many finite minds and the source of their sensory perceptions. As the cause of these perceptions, he guarantees the coherence and reality of the world.¹⁴

Winkler, *Berkeley. An Interpretation*, esp. chs 2 and 3. Winkler argues that Berkeley's criticism of Locke's abstract ideas also bears on Locke's simple ideas, which Berkeley takes to be abstract: 'the evidence is overwhelming that Berkeley takes Locke's simple ideas to be illegitimately abstract, whether or not he believes that Locke himself takes them to be abstract ideas', p. 71. This is controversial. It is clear, at any rate, that Berkeley doubts the existence of simple ideas.

¹² Locke, *Essay*, II.1.10.

¹³ Berkeley himself repeatedly puts it like this, but it is a moot point whether in the last resort he was aiming at a phenomenalist reduction. For a full discussion of this issue see Winkler, *op. cit.*, chs 6 and 7.

¹⁴ That Berkeley held God to guarantee the coherence and reality of the world

Despite what the title suggests, this book by Berkeley is not just about human knowledge. In addition, or rather, on the basis of that, it is a treatise on the existence of things. The Lockean inspiration of such an enterprise is evident enough, but the polemic against this illustrious predecessor is equally clear. Berkeley considered that Locke chose the right starting-point—the ideas in our mind—, but was thoroughly inconsistent in his further reasoning, not only by admitting abstract ideas, but also by accepting the existence of material substances that mysteriously influence our senses in such a way that our perceptions mysteriously emerge as a result. According to Berkeley, only minds can cause or bring about something; even ideas, taken by themselves, are causally inert. Whether Berkeley himself was consistent, however, is debatable. How could he be so certain of the existence of minds as individual active substances, completely different from the ideas that they contain? Berkeley himself admits that we have no ‘idea’ of the mind, but at most a ‘notion’. It is also very unclear how, philosophically speaking, he can know that there is only one infinite mind. On the basis of his premises, the most he could argue is that there must be higher minds that call our sensory perceptions into being.

What are the implications of all this for the problem of time? Of course, for Berkeley the possibility that time can exist independently of mind is ruled out from the start, for he considered nothing to exist independently of the mind. What exists is either mind or a perception or complex of perceptions of a mind. It is true that this does not necessarily mean that everything is mental. A.A. Luce, A.C. Grayling and others have argued vigorously that the ‘existence in the mind’ that Berkeley attributes to the ideas is not mental existence, but only existence in relation to a perceiving mind, an existence that can only be conceived in that way. Thus for Berkeley ideas are not *modi* or properties of the mind, as they are for the

is, I believe, uncontested, but it has been argued that uninterrupted continuity does not play a part here because Berkeley was not interested in it. Cf. Jonathan Bennett, ‘Berkeley and God’ in Martin and Armstrong, *op. cit.*, pp. 380–399. Although a few passages in the *Principles* do support this view (such as sections 4 and 45–46), I concur with E.J. Furlong and A.C. Grayling in holding that this interpretation is untenable. See Furlong, ‘Berkeley and the Tree in the Quad’ in Martin and Armstrong, *op. cit.*, pp. 400–408, and Grayling, *Berkeley: The Central Arguments*, pp. 117–129; cf. also Winkler, *op. cit.*, pp. 216–224.

Cartesians, but objects of the mind.¹⁵ With all that, however, these objects are still completely dependent on the mind. Without the minds the ideas disappear too, and with them time, whatever it may be.

In fact, Berkeley repeatedly expressed his views on time. It was an issue that interested him right from the start, for an important part of the earliest notes that he used as a preliminary study for his *Principles* (published much later under the title *Commonplace Book* and in an improved form under the title *Philosophical Commentaries*) was devoted to it. In essence, he saw time as a succession of ideas, that is, a succession of *somebody's* ideas. It was thus necessarily subjective: everybody has his or her own time. In the first of the three dialogues between Hylas and Philonous (intended as a concise exposition of his philosophy, published in 1713), a drastic conclusion is drawn from this. Philonous convinces Hylas that one person's time can proceed faster than that of another person, so that one and the same movement, perceived by both of them, appears to be proportionately slower for the one than for the other.

In the *Principles* it is mainly sections 97, 98, 110 and 111 that are concerned with time, and here too time is linked to somebody's ideas that are always thought to be concrete. Time is 'nothing, abstracted from the succession of ideas in our minds'.¹⁶ Berkeley's argument is here his opposition to generalising abstraction. An abstraction of that kind cannot exist, because nothing is left; it is pure illusion. Berkeley's rejection of the concept of duration as 'continuation of existence' (Descartes), of Locke's abstract notion of duration, and of Newton's absolute time is simply derived from that. Berkeley does not refer to them by name, but there can be no denying that he had primarily these three thinkers in mind. Descartes and Locke were already alluded to in section 97: 'Bid your servant meet you at such a *time*, in such a *place*, and he shall never stay to deliberate on the meaning of those words. [. . .] But if time be taken, exclusive of all those particular actions and ideas that diversify the day, merely for the *continuation of existence*, or duration in abstract, then it will perhaps

¹⁵ Luce, 'Berkeley's Existence in the Mind', in Martin and Armstrong, op. cit., pp. 284–295; Grayling, op. cit., esp. II.6 and III.2.

¹⁶ *Principles*, section 98 (emphasis deleted).

gravel even a philosopher to comprehend it'. Newton is the main butt of sections 110 and 111, discussed below.

The first sentence in the passage quoted above shows that Berkeley does not entirely stop at the subjectivity of time. A certain coordination of the subjective times in human interaction is apparently possible and is recognised by him. Agreements can be made that bring about a regulated, social calculation of time, so that, for example, a servant can understand what his master requires of him. But that is as far as he goes. There is no genuinely common passage of time; the social construction on the basis of subjective times is in essence a fiction. Of course, like the subjective times themselves, it is also relative. Like Leibniz, Berkeley accepts only a relative time, but unlike Leibniz, Berkeley considers this relative time to be fully tied to the mind and its concrete ideas.

Any objective time would have to proceed from God, just as the objectivity of our sensory perceptions proceeds from God. That is the only way for time to become independent of the subjective world of ideas of finite minds. However, this solution is blocked by God's timelessness. God does not experience his ideas in succession, but simultaneously. He lives in the permanent present, an eternal now.¹⁷

This conclusion is not without its problems, for in spite of his own timeless eternity, God does bring about succession. He is the source of our sensory perceptions and ensures their coherence and continuity. More in particular, he is also the cause of the laws of nature, which are not based on any causal connection between physical events, but are regularities brought about by God on the basis of which we may entertain certain expectations; the presumed cause is in fact nothing more than a sign or an indication that the presumed effect will follow. This all implies sequence, relative duration and simultaneity. In some way or other these must exist within God's ideas, albeit subordinated to the eternal now. In that case, could not God just as well have had an absolute or at least objective time at his disposal, and allowed the finite minds of human beings to partake of it?

A reply in the affirmative brings one close to a view put forward by Malebranche, who claimed that everything that we know, not

¹⁷ Cf. Grayling, *op. cit.*, section 'Mind and Time', esp. pp. 175–177 and 182.

only the eternal and unchanging essences, but also the temporary and mutable things, is only known in and through God and the eternal divine reason (*que nous voyons toutes choses en Dieu*). It was partly in this connection that he attributed an intelligible extension to God; might God have an intelligible duration or time as well? Berkeley's answer to this question is apparently in the negative. The probable reason for this is that that objective, absolute or intelligible time would have been an abstract idea, and Berkeley held abstract ideas to be inconceivable and thus incapable of existing even for God. That is why, presumably, there are only subjective and social time, which are both relative times.

Berkeley studied Malebranche intensively in his youth and was influenced by him. Initially he was even taken by some readers to be a follower of Malebranche. There were clear points in common, such as the fear of and opposition to scepticism, the crucial role of the (so-called) material things in this connection, and above all the function of God as the ground of all our knowledge and the cause of coherence (Malebranche's so-called occasionalism). Berkeley's solution to scepticism, however, namely his view that there is no material world behind our perceptions, differed in principle from Malebranche's position, for the latter argued that we find the sought-after knowledge in God; in our perceptions we experience the ideas of God, which are at the same time the archetypes of all things. Since God occupied a central place in Berkeley's own philosophy too, he attached importance to clearly distinguishing his system from that of Malebranche on this point. Section 148 of the *Principles* is an explicit rejection of Malebranche's position on this: 'Not that I imagine we [...] see corporeal things, not by themselves, but by seeing that which represents them in the essence of God, which doctrine is, I must confess, to me incomprehensible'. This incomprehensibility might once again be connected with Berkeley's rejection of abstract ideas.¹⁸

Berkeley had a final shot to fire on the question of the dependence of time on mind. Time is connected with relations between ideas, and relations, according to Berkeley, are based on the action

¹⁸ On the relation between these two philosophers see Luce, *Berkeley and Malebranche*; H. Bracken, *The Early Reception of Berkeley's Immaterialism 1710–1733*; and C.J. McCracken, *Malebranche and British Philosophy*.

of a mind. This already applies to all numbers. The mind must first make certain combinations before there is even anything to count; what is considered to be one thing is based on 'some particular combination of ideas arbitrarily put together by the mind'.¹⁹ In this way, every number is a product of the mind. Generally speaking, relations are based on an 'act of the mind'.²⁰ That this also applies to time is not stated by Berkeley in so many words, but it is certainly implied. To start with, succession of ideas is already a relation. Moreover, the social regulation of the subjective successions covers a good deal more relations, and of different sorts at that. These are based on the activity of a group of persons, that is, finite minds. And there is no other, higher time.

The conflict with Newton's absolute time is evident enough here. Even clearer was Berkeley's criticism of absolute space and absolute movement. He also devoted more attention to this question.²¹ He dealt with it in eight sections of the *Principles* (110–117), including a discussion of the experiment with the rotating bucket, and he devoted a separate treatise to the subject, entitled *De Motu*, that he wrote in 1721 for a contest organised by the Royal Academy of Sciences in Paris. *De Motu* also contained his reaction to the experiment with the two spheres revolving around one another. In both cases Berkeley remarked that in the absence of any other object, no movement is left at all. When in the former experiment the bucket and the water are said to revolve around their common axis, and in the latter experiment the two spheres are said to rotate around their common centre of gravity, there is in fact no movement. Even leaving aside the passage of time that is contained in these movements, Berkeley could have drawn the same conclusion for so-called shifts in absolute time. He did not do so, but the analogy imposes itself and he must have agreed with Leibniz that a so-called shift of the whole world in time is not a real shift.

Besides his criticism of such fictive events in an otherwise empty universe, Berkeley's *De Motu* also tried to oppose Newton's arguments in favour of absolute movement in another way. He pointed out that rotating buckets and spheres revolving around one another are in

¹⁹ *Principles*, section 12.

²⁰ *Ibid.*; cf. Warnock, *Berkeley*, pp. 203–204.

²¹ Cf. e.g. W.A. Suchting, 'Berkeley's Criticism of Newton on Space and Movement'.

fact involved in so many movements (such as the movements of the earth around its axis, in relation to the sun and the moon) that it is implausible that the result would be an absolutely circular rotation.²² He could have added that, even if this happened to be the case somewhere by a fortunate coincidence, it would not apply (any longer) at a later moment or in a different place.

Absolute movements may be unreal and a fortiori unknowable, but Berkeley insisted on both the reality and the knowability of *relative* movements. More in particular, he opposed Newton's view that relativity and appearance go hand in hand. A person who moves in relation to the pavement is really moving, but the pavement is not.²³ Just as Leibniz had felt the need to turn certain relative movements into absolutes, Berkeley was interested in tracing *real* relative movements. Unlike Leibniz, however, he did so not by assuming unknowable forces, but by adopting familiar components of everyday experience as the foundation. He appealed to 'everyman of common sense', including the best philosophers. They know what real movement and real rest are, which are no less real because they are relative.²⁴ In physics, at least the physics of terrestrial phenomena and the solar system, the movement in relation to the fixed stars would be sufficient.²⁵ Even as a means of calculation (Berkeley speaks of a 'mathematical hypothesis'), absolute space, unlike the force of gravity, for example, was of no use at all.

Finally, Berkeley combatted Newton's conception of absolute space on religious grounds. This conception entailed the attribution of a number of divine properties to space: eternity, uncreatedness, infinity, indivisibility and immutability.²⁶ Joseph Raphson had drawn the same conclusion in his treatise of 1702. The idea of a second entity with all of these properties belonging to God was heresy for some, including Berkeley; the alternative—that absolute space coincided with God—was even worse. The fact that Newton explicitly made space and time subordinate to God in the second edition of his *Principia* took the barb out of this accusation.

²² Berkeley, *De Motu*, section 62.

²³ *Principles*, section 113.

²⁴ *Ibid.*, section 113.

²⁵ *De Motu*, section 64.

²⁶ *Principles*, section 117; *De Motu*, section 54. See above, p. 145.

Raphson had only discussed the divinity of space. Could Berkeley have directed his criticism just as well against absolute time? Yes, to a certain extent, since if absolute time existed it would also be eternal, uncreated, infinite and indivisible. But immutable? That is the question. Newton's absolute time flows; one by one, moments and periods pass by. The immutable eternity of God was traditionally the opposite to mutable time, and that could remain the same for absolute time. The presence of divine properties was thus less complete in the case of time than in that of space, and there was here even an explicit contrast with the divine, so that competition with God, and a fortiori unification with God, was a less obvious choice. So Berkeley had less reason to be on his guard. That does not alter the fact that the remaining correspondences must have been equally unacceptable to him. But *that* does not alter the fact that relative time, like relative space, must have had a place in the divine mind as well as in the human mind.

Following Berkeley, David Hume also rejected the existence of Lockean abstract ideas in his *A Treatise of Human Nature* (1739). He subscribed to Berkeley's criticism and solution, even praising his contribution as 'one of the greatest and most valuable discoveries that has been made of late years in the republic of letters',²⁷ but he did not abandon the term. What Berkeley chose to call general ideas became abstract ideas again in Hume's terminology: 'Abstract ideas are therefore in themselves individual, however they may become general in their representation. The image in the mind is only that of a particular object, tho' the application of it in our reasoning be the same, as if it were universal'.²⁸

Hume took ideas to constitute only a part of the total contents of the mind. 'Perceptions' was the overarching term that he, like Berkeley, used for all elements of the mind. The mind itself (and here Hume adopted a very different view from Berkeley's) is nothing but the total of these perceptions in a certain order and a certain connection. Hume divided the perceptions into impressions and ideas. The difference lies in the manner in which they present themselves: the impressions are characterised by a greater force and vitality. Hume attributes this to the fact that ideas are derived in some way from

²⁷ *A Treatise of Human Nature*, I.I.7, p. 17.

²⁸ *Ibid.*, p. 20.

impressions. They are diluted copies or representations of them, for example in the memory or the imagination. More in particular, they form the content of our thoughts, while the impressions are our sensory experiences and our feelings.

Hume dealt with space and time immediately after the introduction of his fundamental concepts in Part II of Book I of the *Treatise*. He argued that we only know time through the succession of our perceptions, emphasising that this perceived succession does not form a separate perception of its own, but is only the way in which the perceptions concerned present themselves.²⁹ The idea of time is derived from this and, given its generality, is an abstract idea in the Humean sense. Although we can only imagine or conceive of time, like everything else, as something concrete, i.e. ‘by some particular idea of a determinate quantity and quality’,³⁰ this idea nevertheless has a vast scope. It covers everything that might have prompted the mind to form the idea of time. Every change, every succession is covered by the abstract idea of time. It even covers domains that in principle do not have time because nothing happens there. Empty time is a pseudo-time that strictly speaking, according to Hume, does not exist, but we behave as though it did. We imagine that time passes, even in situations in which not a single change occurs. It is a fiction (the word is Hume’s) based on the fact that the idea of time is simply always present in our minds.³¹

Hume here seems to have difficulty with the admission that time goes on without us in some way, for it is only because we have generalised it in our minds without any limitations that it is applicable outside us without any limitations. ‘For we may observe, that there is a continual succession of perceptions in our mind; so that the idea of time being for ever present with us; when we consider a steadfast object at five-a-clock, and regard the same at six; we are apt to apply to it that idea in the same manner as if every moment were distinguish’d by a different position, or an alteration of the object’.³² Does this mean that he holds time to be dependent on the mind? The idea of time would first be derived from the succession of per-

²⁹ Ibid., I.II.3, p. 36.

³⁰ Ibid., p. 35.

³¹ Ibid., I.II.3 and I.II.5, pp. 37 and 65.

³² Ibid., I.II.5, p. 65.

ceptions, and then applied to all situations in which change takes place, to be extended in the end through a fiction to situations of immutability.

This apparent dependence of time on mind was not Hume's last word. There can be no doubt that he believed that time passes in the world independently of us human beings, and that it is presupposed, in some way or another, by the events that take place there. When he comments 'Wherever we have no successive perceptions, we have no notion of time', he is referring to our lack of knowledge of time, and when he continues 'even tho' there be a real succession in the objects' he is raising the possibility that time nevertheless exists.³³ This underlying idea is formulated even more clearly when Hume replaces the standard formula—that the idea of time lies merely in the succession of perceptions—with the claim 'that time is nothing but the manner, in which some real objects exist'.³⁴ In other words, time exists in the succession of real things. It may be that this claim is a deliberate simplification in that particular context, but it is perfectly understandable that Hume put it like that. With his realist common sense, it is unlikely that he would have seen time as a mental construct. It is evident that he was keenly interested in how people can arrive at the idea of time and in the question of what kind of an idea this is, but he must have been certain that this idea concerns a given that exists outside us. This conviction emerges at several points in the passages on time and space.

Both Hume and Berkeley followed Locke's scheme of investigating and determining the origin and scope of human knowledge by means of an analysis of the elements of the human mind. But while Berkeley's account is characterised by far-reaching idealism (everything that exists is a mind or exists only in, or in direct relation to, a mind), Hume's was characterised by a moderate realism. It is not surprising that the differences are salient when it comes to the question of the relation between time and mind. While for Berkeley time was completely dependent on mind for more than one reason, for Hume time exists outside the mind and is independent of it. But there is no trace of Newton's absolute time in Hume either. Hume's time is embodied in the change and succession of things; without

³³ *Ibid.*, I.II.3, p. 35.

³⁴ *Ibid.*, I.II.5, p. 64.

them, there can be neither time nor an idea of time. Unlike Locke, Hume does not distinguish between duration and time, since both words have the same meaning for him. Hume may have been inspired by Newton's systematic and comprehensive mechanics and may have entertained the ambition of establishing an analogous human science for a while, but right from the start he cannot have seen much in Newton's absolute notions of space and time.

Thomas Reid, for his part, saw little in Hume's realism and common sense. He regarded Hume's philosophy, in spite of all his admiration for it, as a *reductio ad absurdum* of the empiricist premise that our knowledge of the world is only brought about through the mediation of ideas or perceptions. On that premise, the external world, including other human beings, becomes in principle inaccessible, or (as Berkeley had concluded) it is reduced to a cluster of ideas. Reid considered such conclusions to be grotesque. By contrast, he defended the view that what we perceive in our perceptions are not ideas but material objects. That is what genuine common sense teaches us, he claimed, and he was its most important defender at that time. The explicit appeal to common sense that even Berkeley had made must have seemed a travesty to Reid.

He wrote extensively on the senses in his first major work, *An Inquiry into the Human Mind. On the Principles of Common Sense* (1746). He returned to them in his following book, which was mainly devoted to the intellectual capacities, *Essays on the Intellectual Powers of Man* (1785).³⁵ Time is discussed in the third essay of the latter book, 'Of Memory'.

Reid disagreed with the notion that our knowledge of duration is based on the experience of the succession of ideas, as Locke had been the first to argue. Reid's main counter-argument is that in that case each of the ideas would have to have duration, because otherwise their succession would not produce duration.³⁶ His own position is that the knowledge of duration is based on memory. Just as we know the external world directly through the senses (what we perceive *is* the external world), so the memory provides us with direct knowledge of the past; what we remember *is* what took place: 'It is

³⁵ A.D. Woozley published a slightly abbreviated edition with an excellent introduction.

³⁶ Reid, *Essays*, III.5.

by memory that we have an immediate knowledge of things past'.³⁷

Both forms of knowledge are justified in two of his principles of contingent truths: 'that those things do really exist which we distinctly perceive by our senses, and are what we perceive them to be', and 'that those things did really happen which I distinctly remember'.³⁸ It is true that Reid does not manage to devise a plausible theory about how that is done, or of how one can distinguish between genuine and apparent perceptions and memories. Sometimes, when he makes an attempt in that direction, he comes suspiciously close to Locke's causal doctrine of perception—a doctrine that Reid had combatted and rejected. What is perceived is then described as what is regarded as the cause of the impression concerned.³⁹ Other attempts are equally unsuccessful. In neither case, according to Reid, do we have any idea of how that direct knowledge could exist without direct contact. He admits the impasse frankly.⁴⁰ That is one of Reid's attractive sides. While a good many philosophers devise solutions that are much more problematic than the original problem, in such cases Reid prefers to leave the problem unresolved rather than to come into conflict with evident experiences and beliefs.

We know the past, of course, but not the future. That is how our creator wanted it; he could also have deprived us of memory and given us the ability to see directly into the future.⁴¹ Since this is the way it is, Reid grounds our knowledge of time as follows: 'It is essential to everything remembered that it be something which is past; and we cannot conceive a thing to be past without conceiving some duration, more or less, between it and the present. As soon therefore as we remember anything, we must have both a notion and a belief of duration. It is necessarily suggested by every operation of our memory; and to that faculty it ought to be ascribed'.⁴² *Mutatis mutandis*, the same would have been possible with a faculty for looking into the future.

This standpoint is in important respects more convincing than that of Locke, Berkeley and Hume, for whom succession plays a central

³⁷ *Ibid.*, III.1; Woozley, p. 194.

³⁸ *Ibid.*, VI.5; Woozley, pp. 380 and 378.

³⁹ *Ibid.*, II.16; Woozley, p. 151.

⁴⁰ *Ibid.*, III.2; Woozley, pp. 198–199.

⁴¹ *Ibid.*, III.2; Woozley, p. 199.

⁴² *Ibid.*, III.3; Woozley, p. 200.

role. As already pointed out, the role of memory, even if only short-term memory, is essential to that. But no matter how essential memory may be for our understanding of duration, not even Reid considers that duration is dependent on memory, and thereby on our mental capacities and thus on our mind. According to Reid, duration exists externally to us in reality, of which we ourselves also partake.

In an important passage, Reid then appears to make a distinction, that has since become known as McTaggart's distinction between the A-series and the B-series of temporal phenomena. Reid wrote: 'The parts of duration have to other parts of it the relations of prior and posterior, and to the present they have the relations of past and future'.⁴³ Unlike McTaggart, however, Reid was not interested in the differences and dilemmas of these two sets of relations, but in their combination. For instance, he shows how the idea of the future can be derived from the concepts of present and later. He does not discuss possible inconsistencies. Unlike McTaggart again, Reid is therefore incapable of declaring the sequence of past-present-future to be inconsistent, and thus time to be unreal. He would have regarded such a conclusion as another breach of common sense; we simply know that time exists, and no philosophical speculation can affect that certainty.

It has been suggested that Reid's appeal to the unshakable certainty of such common sense convictions (more than to our actual inability to call them into doubt, as in Hume) has a Kantian tone. After all, it recalls the synthetic a priori judgements of Kant's transcendental philosophy. Did Reid perhaps mean that such common sense convictions determine the framework within which we can experience the world? At any rate, both philosophers responded in an analogous manner to the work of Hume, whose scepticism regarding the reliability of our knowledge they tried to evade. They also did so at more or less the same moment. Reid was fourteen years older than Kant, but by the time he published his *Essays on the Intellectual Powers of Man* later in life in 1785, Kant's *Kritik der reinen Vernunft* (1781) and his *Prolegomena zu einer jeden künftigen Metaphysik, die als Wissenschaft wird auftreten können* (1783) had already been published. Reid did not react to them.

⁴³ Ibid., III.3; Wozzley, p. 200.

Kant, on the other hand, had reacted to Reid, harshly criticising him and a few allegedly like-minded scholars. He did so in the preface to the *Prolegomena*, in which he accused Reid of letting philosophy capitulate to the applause of the crowd through his appeal to common sense. The allegation is unfounded.⁴⁴

Other differences between their standpoints are evident enough. For Reid the first principles of common sense, no matter how reliable and uncontestable, were contingent truths. Nor does his work contain any reference to time as an a priori given in some way or other, and he certainly did not regard time as anchored in the human mind. Kant, on the other hand, was and is the best-known philosopher to have made time entirely dependent on mind and consciousness.

To start with, Kant defended the thesis that time cannot be based on change, as Leibniz and many before him had thought. For the notion of change, after all, implies the notion of incompatible properties, and these are properties that by definition cannot operate *at the same time*. The principle of non-contradiction or of (in)compatibility could thus only be formulated and understood with the aid of the notion of simultaneity. Later in the *Kritik der reinen Vernunft*, Kant even argued that the categories of the understanding in their generality presuppose time.⁴⁵

Moreover, he claimed that insoluble antinomies arise if time is located in the external world, independently of perception, in reality in itself. Take, for example, the question of whether the world had a beginning in time. If not, an endless duration of time would have passed by up to the present, and that is impossible. A duration of time can at most be potentially infinite. So the world must have had a beginning in time. But in that case, the world would have been preceded by an empty time, with completely equivalent moments. There would have been no ground at all for the world to begin at one moment rather than another. So this possibility has to be discarded too.⁴⁶

⁴⁴ Woozley has made the case for Kant's probably not having read anything by Reid at that date, and certainly not his *Inquiry*: *Ibid.*, pp. xiii and xxxii–xl.

⁴⁵ *Critique of Pure Reason*, B 48–49 and 300–302. Following convention, A refers to the first edition (1781) and B to the second edition (1787).

⁴⁶ For critical remarks on Kant's argumentation, see Van Benthem, *The Logic of Time*, pp. 32–35 and 234–236.

Most of Kant's arguments had already been made before, but he drew a radically new conclusion from them. He remarked that the antinomy only disappears once we stop seeing time as something external and make it fully dependent on our capacities of perception, representation and thought instead. Kant held that time belongs to us, the observers, and not to the world in itself. *We* arrange phenomena in time. We have to do so in order to arrive at a coherent view of the world (for Kant that was the worldview of Newtonian natural science), and we do so in combination with the attribution of categories such as permanent substance, cause/effect and interaction.⁴⁷ As far as we know, the world has no time outside and independent of us, and for similar reasons the same is true of space. We project both time and space into the perceptible world and their validity is confined to that. Our point of reference for projected time is the present, and it is from there that time extends in a potentially endless line towards the past and towards the future. The problem of whether the world *in itself* had a beginning in time thus disappears.

Time is thus not a dimension of the world in itself but a form of perception or intuition (*Anschauung*), and as such it is a priori. As Kant put it: 'Time is therefore a purely subjective condition of our (human) intuition [. . .] and in itself, apart from the subject, is nothing'.⁴⁸ This subjectivity is not personal, but interpersonal. In fact, it serves precisely to guarantee the objectivity and the necessity of the knowledge of nature, as Kant immediately goes on to state: 'Nevertheless, in respect of all appearances, and therefore of all the things which can enter into our experience, it is necessarily objective'.⁴⁹ In this way time combines transcendental or absolute ideality with empirical reality. More in particular, it is, unlike space, the form of our inner faculty of representation, our 'inner sense'. That is why its relation with external experience, unlike that of space, is partly indirect.

On this ground time also plays a key role in Kant's theory of schematism, his answer to the question of how it is possible for objects of experience to fall under general concepts. According to Kant, that can only be understood if there is a condition that links

⁴⁷ The latter forms more in particular the basis of the empirical knowledge of simultaneity.

⁴⁸ *Critique*, A 35, B 51.

⁴⁹ *Ibid.*, A 35, B 51.

them, namely the schema of pure understanding. In the case of sensory concepts such as 'triangle' or 'dog', this schema is a rule that enables and determines the formation of concrete representations.⁵⁰ In the case of the pure concepts of the understanding (the categories), however, there is no link with concrete representations. What is at stake here is a pure synthesis, a transcendental product of the imagination on the basis of our inner capacity to have representations, whose form is time.⁵¹ So the schema of each of the categories necessarily implies time, and Kant shows how that happens in the different cases (for quantity, reality, substance, causality, reciprocity, possibility, actuality and necessity). For the category of substance the schema is 'permanence of the real in time', the representation of permanence as abiding amid all changes, and he adds the following explanatory comment: 'The existence of what is transitory passes away in time but not time itself. To time, itself non-transitory and abiding, there corresponds in the [field of] appearance what is non-transitory in its existence, that is, substance'.⁵²

However absolute all this may sound, Kant makes it clear that what he is saying only applies to us human beings. He repeatedly points out that for us sensory intuition is the only form of intuition, and he raises the possibility that other beings have a non-sensory, more in particular an intellectual intuition. He suggests it immediately as soon as he comes to discuss the concepts of the understanding: 'The knowledge yielded by understanding, *or at least by the human understanding*, must therefore be by means of concepts, and so is not intuitive, but discursive'.⁵³

The question is raised more explicitly in the chapter 'The Ground of the Distinction of all Objects in general into Phenomena and Noumena'. A noumenon (or a thing in itself) is characterised negatively as something that is not an object of our sensory intuition,

⁵⁰ Ibid., A 140–142, B 179–181.

⁵¹ 'It is a transcendental product of imagination, a product which concerns the determination of inner sense in general according to conditions of its form (time), in respect of all representations, so far as these representations are to be connected a priori in one concept in conformity with the unity of apperception.' *Critique*, A 142, B 181.

⁵² Ibid., A 143, B 183. According to Heidegger, Kant is here referring to the permanence of the present; see his *Kant and the Problem of Metaphysics*, 5th ed., pp. 134–136, and cf. *Being and Time*, section 81.

⁵³ Ibid., A 68, B 93; emphasis added.

and positively as something that is the object of a non-sensory intuition.⁵⁴ Kant adds that we cannot gain any insight into the possibility of such a non-sensory intuition, and somewhat later he states that we are not justified in assuming its existence.⁵⁵ So for us humans it is only the negative characterisation that has any meaning: ‘Since, however, such a type of intuition, intellectual intuition, forms no part whatsoever of our faculty of knowledge, it follows that the employment of the categories can never extend further than to the objects of experience. [. . .] That, therefore, which we entitle ‘noumenon’ must be understood as being such only in a *negative* sense’.⁵⁶ Nevertheless, this and a few other passages indicate that Kant did not rule out the possibility of such an intellectual intuition, even though we humans have no access to it.

As an object of intellectual intuition, the things in themselves might have unsuspected properties. Perhaps even a form of time? For us they are timeless and immutable, unlike the objects of sensory intuition. But are they really that? Kant himself says: they are only concepts because they are postulated by the understanding, not because they correspond to the categories of the understanding.⁵⁷ After all, there is nothing to be said about their quality. Then the question still arises of whether under intellectual intuition they might prove to be temporal—temporal not in the sense of our notion of time, because that is intrinsically linked to the sensory experience, but as an object of the intellectual intuition that we do not have. The possibility cannot be ruled out.⁵⁸ According to Kant himself, however, speculation on that score would be worse than useless.

A question with less far-reaching implications is that of whether all intelligent beings necessarily have the same forms of sensory intuition as we do. According to Kant, it is not absolutely necessary for the forms of intuition of space and time to be limited to the human senses; it may be the case that other beings are (necessarily) in harmony with us in this respect, without our knowing it.⁵⁹ On the other

⁵⁴ *Ibid.*, B 307.

⁵⁵ *Ibid.*, A 254, B 309; cf. A 256, B 312.

⁵⁶ *Ibid.*, B 308–309.

⁵⁷ *Ibid.*, B 306–307.

⁵⁸ Later, Trendelenburg was even to defend the possibility that the things in themselves are subject to the same time as the things of experience. See below, p. 174.

⁵⁹ *Ibid.*, B 72.

hand, however, this need not be the case, and other forms of sensory intuition may be possible.

With all those remarks on the possibility of a different experience of reality on the part of beings that are unknown to us, it is noteworthy that Kant does not pay any attention to the possibility of different conceptions of reality among beings that *are* known to us, such as other human beings and animals. He assumes without further ado that from the first and everywhere humanity has always known, and still knows, the same time and space. Although theories were advanced in Kant's day on the mental developments that humanity has been through and on the existence of different cultural mind-sets, Kant was firmly convinced of the uniformity of the human race.⁶⁰ Neither was Kant interested in the possibility that animals might have different forms of intuition. Nevertheless, it was natural to ask in what sense animals, especially the higher animals, have forms of intuition of space and time. Kant evades the issue, and only takes into account space and time as developed by humanity over a long period, as if this were necessarily and exclusively so. All too often he speaks in much too absolute terms about the conditions under which alone experience is possible.⁶¹

⁶⁰ This is true of Kant's epistemology. The situation is very different in his *Anthropologie in pragmatischer Hinsicht* (1798).

⁶¹ See, for example, the first section of 'Time' = 'Transcendental Aesthetic, Section 2. Time', §4. For an incisive and concise criticism of Kant's exceptionally static picture of the perceiving mind, cf. Norbert Elias, *Time: An Essay*, pp. 38–39 and 63.

CHAPTER THIRTEEN

IDEALISTS VERSUS REALISTS

After and because of Kant, German idealism emerged. Kant himself would hardly have been pleased by this development, but it did proceed from his work.

Reflection on time played an important role here and there among these philosophers too. An intriguing example is Johann Gottlob Fichte. He published his *Grundlage der gesamten Wissenschaftslehre* for his students at the University of Jena in 1794. This work summarises his teaching on a number of fundamental topics and principles.

He argued that in the first instance the Ego posits itself and its opposite, Non-ego. That means at least that the Ego exists through consciousness of itself and of its opposite, but Fichte went further. After stating in the third fundamental principle that Ego and Non-ego are both finite and divisible, Fichte describes how this absolute Ego posits the entire knowable reality, and thus in fact brings it about. And knowable reality is reality itself, for Fichte abandons the Kantian unknowable thing-in-itself, regarding it as an inconsistency on the part of his predecessor.

This action of the absolute Ego is only possible, according to Fichte, thanks to the productive or creative imagination. This force is able to bring opposites together without their mutual abolition. It is in this connection that time appears on the scene, for it is this ability to unify opposites 'which alone makes possible life and consciousness, and consciousness, especially, as a progressive sequence in time'.¹ More in particular, the imagination brings about a situation of abeyance, of a subtle balance between the transition from something into its opposite and the retention of both. 'It is this wavering of imagination between irreconcilables, this conflict with itself, which [. . .] extends the condition of the self therein to a moment of *time*'.² That is how brief moments of time arise.

¹ Fichte, *Science of Knowledge*, I, 205.

² *Ibid.*, I.217.

Reason, on the other hand, cannot bring about time. It only posits what is permanent, in the first place the imagination itself (*Einbildungskraft*), the permanent and stable source of all that is in flux. That is why ‘for reason pure and simple, everything is simultaneous; only for imagination is there such a thing as time’.³

The whole of reality is here seen as the product of the capacities of the absolute subject, above all by virtue of its productive imagination. As Fichte himself summed it up: ‘[. . .] all reality—for us being understood, as it cannot be otherwise understood in a system of transcendental philosophy—is brought forth solely by the imagination’.⁴ Such a reduction of the world to a central principle (though in this case related to an Ego) is reminiscent of the system of Plotinus. For both Plotinus and Fichte, time is an emanation of a timeless, mental capacity. But for Fichte, unlike Plotinus, time is very close to the central principle. After all, time is here the immediate consequence of the most characteristic property of the power through whose agency the world is brought about, namely the synthetic faculty of the imagination. As soon as the imagination of the absolute Ego has produced something, time exists too. There is here no sphere of eternity in close proximity to the centre, but only and immediately temporality.

Perhaps this is true to an even greater extent of Hegel, for he, unlike Fichte, did not see any discrepancy between reason and temporality. While for Fichte reason in itself is unconnected with time and the imagination is required to produce time, for Hegel rationality is directly converted into historical development. It is historical through and through. Not only that for Hegel philosophy essentially coincides with its own history, but the history of the world is a rational process too in his eyes. The reasons of reason (*propter*) correspond to succession in world history (*post*). If Hegel can call ‘world history’ (*Weltgeschichte*) the ‘world’s court of judgement’ (*Weltgericht*) at the same time, that is not because of the arbitrary ‘right of the winner’, but because of what he regarded as the guaranteed rationality of the winning.⁵

³ Ibid., I.217. There is a role for the understanding here, for although imagination produces reality, it is only when it is understood by the intellect that the product turns into something real (ibid., I.233–234).

⁴ Ibid., I.227.

⁵ Hegel, *Grundlinien der Philosophie des Rechts*, section 340. Cf. also section 342: ‘It

The dependence of world history on a mental faculty and thereby on the mind (here the general mind) is thus very strong. The same is true of other aspects of history. Does it also apply to time as such? Given Hegel's general premises, this must indeed be the case, but he has less to say about it. In his natural philosophy, a part of the *Enzyklopädie der philosophischen Wissenschaften*, he sided in principle with Kant on space and time. Both are forms of intuition for him too, although he distances himself from the predicate 'subjective' and emphasises their abstract character; they are the forms of perceptions, but cannot themselves be perceived. More in particular, they concern the completely abstract extrinsicality (*das ganz abstrakte Aussereinander*). But while space represents the positive collaterality (*Nebeneinander*) that as such is not affected by the internal negations brought about by point, line and plane, time represents the general negation of this collaterality. Time is in fact the *negative* unity of self-externality (*Aussersichsein*): 'It is the being which, in that it *is*, is *not*, and in that it is *not*, *is*'. Time emerges from space through this negation; that is why it can even be called 'the truth of space'.⁶

It is evident that the mind is active here, for the dialectical process bears witness to that. Time could not exist without that process. Nevertheless, the scope of Hegel's philosophy of time is fairly limited. On this point his unorthodox followers Bradley and McTaggart, almost a century later, had a good deal more to offer. The same is true of Arthur Schopenhauer, one of the most important figures within the whole post-Kantian idealist philosophy of time.

Schopenhauer fell back on Kant's distinction between the world of *phenomena* and the world of *noumena*; he felt that he was much more faithful to Kant than his immediate predecessors. Unlike Kant, however, he regarded the thing-in-itself as knowable, and he considered that the all-embracing and omnipotent Will, which we already

is not just the *power* of spirit which passes judgement in world history [...]; It is the exposition and the *actualization of the universal spirit*.

⁶ *Hegel's Philosophy of Nature*, vol. 1, sections 253–259, esp. pp. 229–231. Later, in the *Vorlesungen über die Aesthetik*, he returns to this difference between time and space in connection with music. Although music requires three-dimensional objects in order to be produced, music itself only has time at its disposal. If space is the positive juxtaposition, time is 'a negative sort of externality, i.e. as a point, external juxtaposition being cancelled, and as a negating activity, cancelling *this* point of time to give place to another which likewise is cancelled to give place to another, and so on and on' (*Aesthetics. Lectures on Fine Art*, Vol. II, p. 913).

experience inside us as pure subject, is the only real thing-in-itself. The world of objects, on the other hand, is inevitably and a priori amenable, à la Kant, to space, time and causality.⁷

We can escape from that compulsion in aesthetic enjoyment. Then the subject is freed from the wheel of Ixion to which it is normally bound: here understood as the ever rotating wheel of cause and effect, desire and deceptive satisfaction.⁸ We no longer perceive objects, but experience the everlasting Platonic forms that are expressed in the work of art. Music even represents and expresses the metaphysical core of the world, the Will itself.

So time is here once again not a component or aspect of an independent external world, but an aspect of our representation, our manner of experiencing reality, a form of intuition. In stark contrast to Kant, however, Schopenhauer underlines the illusory character of this experience. After all, Schopenhauer claims to know what the underlying reality is, and we deceive ourselves, according to him, with our representations. When considered properly, the whole of life is a sort of dream.⁹ The knowing subject by itself, however, is external to it; after all, it is not an object. Like the Will to which it belongs, it is timeless, even though it brings about the (illusory) passage of time. It is thus without beginning or end either. Strictly speaking, only the present is real and even permanent, it is a stationary Now (*nunc stans*). Past and future, and with them mutable time, on the other hand, do not exist. They are 'an empty mirage and the web of Maya'.¹⁰

Thus Schopenhauer's metaphysics of the omnipotent, blind Will that operates in an eternal present leads to the insight that our experience of things in time, space and causality is a delusion (*Täuschung*). While for Kant our forms of intuition were among the conditions that make objective irrefutable knowledge possible, for Schopenhauer they turned out to be illusions in the end. In truth there is only one

⁷ Schopenhauer derives all three from the 'principle of sufficient reason' (*Satz vom Grunde*), the insight that everything that takes place and is thought proceeds from or is based on something. The basis of our thoughts is the fourth factor at issue here. The Will, on the other hand, has no ground.

⁸ Schopenhauer, *The World as Will and Representation* I, pp. 195–196.

⁹ *Ibid.*, pp. 16–18.

¹⁰ *Ibid.*, p. 284; cf. further pp. 278–286. Schopenhauer's ideas here are influenced not only by Kant but also by the Indian philosophy of the *Upanishads*.

reality, the Will, that holds up as a mirror to itself the world in which we too can only recognise the Will (that is ourselves as well) in the end. The only choice left us is that between acceptance or rejection, affirmation or denial. In other words, the will to life can maintain or reject itself in us. The latter is the best course: with it, the semblance of time is gone together with the semblance of the world.

In the meantime Kant's ideas about the foundation of our knowledge were elaborated in a very different way by giving the categories and forms of intuition a psychological or physiological interpretation. The turn to psychology could be found in the work of Johann Friedrich Herbart, but was developed above all by Jakob Friedrich Fries in his *Neue Kritik der Vernunft* of 1808 (the second edition of 1828 was entitled *Neue oder anthropologische Kritik der Vernunft*). The physiological interpretation was due to Hermann von Helmholtz. In both cases the connection between the a priori foundation of knowledge and the specific human cognitive faculties was strengthened. That foundation was increasingly made dependent on concrete characteristics of human thought and perception. Time, however, did not play a pronounced role in this. Fries took time in both external and internal perception to be a more or less natural given, and concentrated on the origin of the categories, while Helmholtz was primarily interested in the origin of the conception of space rather than in the problems connected with time.

A completely different direction was taken by Adolf Trendelenburg. In his reaction to Kant, he tried to reconcile those of Kant's views that he found defensible with the philosophy of Aristotle. In his *Logische Untersuchungen* of 1840, and above all in a fierce polemic with the historian of philosophy Kuno Fischer in the 1860s, he argued that Kant was wrong in excluding the possibility that the things-in-themselves could exist in time and space just like the things experienced by us. The knowledge of time and space could be a priori without this necessarily implying anything about the scope of space and time itself. Things as they are in themselves could also be bound by time and space. In that case, time would no longer be by definition a form of sensory intuition, and would even be independent of human experience. It forms a part of Trendelenburg's attempt to maintain a realist metaphysics alongside or opposite to Kant's transcendental philosophy.

All these divergent opinions contributed to the wish on the part

of other philosophers to purify Kant's doctrine of later elaborations and to take its original tenor as their starting point. 'Back to Kant' became their motto (formulated by Otto Liebmann in 1865), and a few Neo-Kantian schools, which sometimes differed sharply from one another, were the result. More in particular, the polemic of Trendelenburg and Fischer prompted Hermann Cohen to go into Kant in depth. He intervened in the discussion, and a few years later published his first great work, *Kants Theorie der Erfahrung* (1871; considerably expanded from the second edition of 1885 onwards). This book laid the foundation of the so-called Marburg School, to which Paul Natorp and Ernst Cassirer later belonged.

Cohen's position was that the subject-bound and therefore a priori character of the forms of intuition and the intellectual categories should be seen above all in relation to the actual existence of science. He and his supporters placed all the emphasis on the function of the a priori as a condition of scientific knowledge. That was regarded as the core of Kant's intentions. As a result, the connection with human psychological or physiological characteristics disappeared, as did that with the ontology of the world. Transcendental epistemology (later preferably known as *Erkenntniskritik*) and logic took their place. As far as time and space are concerned, the much discussed question of whether an understanding of them was innate or not was declared irrelevant. They were seen as formal and constituent conditions of mathematics and the exact sciences, the kinds of knowledge that Cohen identified succinctly under the term 'experience' (*Erfahrung*). As a result of extensive considerations, he formulated it as follows: 'Space and time are a priori, that means [. . .]: space and time are constituent conditions of experience. They have this constituent value as fundamental tools of science. In this sense they are called pure intuitions'.¹¹

With this one-sided emphasis on the a priori as a condition of science, the connection of time with the mind remained intact, though it was more indirect as a result. It can still be said that time and space would not exist here without the mind, but only because without the mind the 'fact of science' would not exist. The reasoning is

¹¹ Cohen, *Kants Theorie der Erfahrung*, p. 284. This does not mean that Cohen's interest was confined to Kant's epistemology. He also wrote books on Kantian ethics and aesthetics, and perhaps felt himself most in accord with Kant's ethics.

vaguely reminiscent of Aristotle's argument that without the mind there would be no number or measure of movement and therefore no time. But the adequate counter-argument in that connection, namely that movement can be numerable or measurable without the de facto existence of a numbering or measuring entity, has no analogue for Cohen and the Marburg School. Their idea of knowability is too dependent on the de facto knowing subject for that.

Apart from that, early Neo-Kantianism did not come up with much that was new with regard to the question of time. This applied equally to Germany as to France, where Charles Renouvier took Kant's philosophy as his starting point and elaborated it further in his *Essais de critique générale* (1854–1864). The problems of *space* were considerably more pressing because of the discovery of non-Euclidean geometries from 1830 on. Their significance in the context of Neo-Kantian epistemology was problematic, especially when that doctrine, as in the Marburg School, made a strong appeal to science. It took a lot of effort to reconcile the new discoveries with Kant's idea of the one, apodictically given space of intuition.

As a problematic theme calling for further reflection, time did not return until after the discovery of the theory of relativity in the beginning of the twentieth century, when Paul Natorp and above all Ernst Cassirer investigated its consequences for Kantian epistemology. While many philosophers had great difficulty in accepting this theory, the Marburg School did not see it as a threat, but even regarded it as a confirmation of their views.

In his *Die logischen Grundlagen der exakten Wissenschaften* of 1910, Paul Natorp already argued that the recent revolutionary developments in the natural sciences did not mean the end of transcendental philosophy. In his view, the conceptions of space and time in the new physics still implied a priori concepts and structures as their foundation. Ernst Cassirer's *Substanzbegriff und Funktionsbegriff* appeared in the same year. Its general argument concerns the replacement of the notion of substance by that of function in the modern natural sciences. He discusses time and space in a separate section, which includes an exposition of his views on absolute space and absolute time. He considers them both to be intellectual constructs. As such, they are the product of the historical development of physics, in particular mechanics; their substantial existence in the external and inner world is irrelevant. Cassirer admits with the conventionalists, including Poincaré, that this historical development leaves a certain scope

for conventional decisions, but on the whole he takes them to be subordinate to the regularity of rational progress.¹²

In 1921 Cassirer published a separate treatise on Einstein's special and general theories of relativity, which had been presented in 1905 and 1915 respectively. The position of absolute space and absolute time called for further elaboration here. While in the earlier work they had been the constructed product of historical development, now they are rather the conditions under which the construction of physical time and space can take place. The historical development, Cassirer argues, leads in one way or another to some kind of ordering of the material world in space and time, and subsequently to new orderings. These are successive intellectual constructs. Absolute time and space function as their general form, that is, each of these orderings presupposes a general idea of temporality and spatiality, though not in the sense that these absolute entities exist as a subjectively given thing in the human mind. On the contrary, they form a system of rules and concepts by which (in combination with experience, of course) empirical time and empirical space are constructed.

A key role is played in this subtle argument by an appeal to Kant's *Metaphysische Anfangsgründe der Naturwissenschaft* of 1786. In that work, Kant had argued that absolute space is not an object but an idea; it is that with which we can consider all material movements as relative in relation to one another. But while Kant certainly took this absolute space to be static, it is almost certain that Cassirer took a dynamic view of it. It seems to be an inevitable consequence of his historicising epistemology that even the transcendental conditions of our cognitive constructs are historicised too. Absolute time and space in the era of Einstein are not what they were in Newton's day. Generally speaking, the conditions of the constructions of natural science are constructs too. It is even conceivable that what is a product in one stage can become a condition in the following stage.¹³

This complex whole of the natural scientific notion of time and space is, of course, entirely dependent on the mind. It could not have got off to a start without the mind, and even if it had, further

¹² Cassirer, *Substance and Function*, ch. IV, section 6. The whole of chapter IV is concerned with a number of key concepts in the natural sciences.

¹³ Cassirer, *Einstein's Theory of Relativity*, esp. ch. 5.

development and progress would have been impossible. It is also pointless to suppose that the history of all these constructs exists latently and that the mind only discovers or reveals it.

Cassirer's historical and cultural perspective was widened in his three-volume *Philosophie der symbolischen Formen* (1923–1929), which is not limited to the development of the natural sciences, but covers the whole development of human culture in its generality. The author explicitly states at the beginning of his chapter on space that the focus of the problem that he raises has shifted from the philosophy of nature to the philosophy of culture.¹⁴ Of course, the natural sciences also have a place in it. They in turn have developed by emancipating themselves from world views such as those that are embedded in language and in myth. The homogeneity of space, for example, had to be rescued from the very non-homogeneous mythical space by progressive abstraction, symbolisation and representation. Now and then Cassirer even resorts to features of animal behaviour and the space of action that is opened up there to complete the panorama.

Exactly the same, he argues, is true of time: the abstract and symbolic time that science has put into our hands can only be properly understood as a stage in an ongoing process of interpretation and representation to which even the time of action belongs. Here too the mythical view of the world had to be overcome, above all the view of time as an independent, operative force.¹⁵ Reality as such is never reached and reproduced; we have always had to deal with a representation designed on the basis of a certain preoccupation.

For time, however, there is more at stake. After all, time is not a pure, unconscious succession. It requires a consciousness that can link present, past and future. So there is an extra reason why time can only be understood on the basis of experienced time, the intuition of time.¹⁶ Cassirer's analysis is inspired by Augustine: past, present and future are interconnected as orientations of and in actual consciousness. All three are essential; and, unlike what Bergson thought (see following chapter), the expectation of the future is just as important as memory for the true concept of time.

Much of what Cassirer writes about the different symbolic forms

¹⁴ Cassirer, *Philosophy of Symbolic Forms*, III, pp. 143–144.

¹⁵ *Ibid.*, p. 164.

¹⁶ *Ibid.*, pp. 169–170, 173.

is connected with historical development. At heart, however, it is not history but the structure of the symbolic forms that interests him. It is not their genesis and decay that matters, but their internal structure and their relations with one another. He even states that they can be understood as so many forms of the objective spirit. He wants to unfold their phenomenology in the Hegelian sense of the word.

Each of these symbolic forms is unable to penetrate to a directly known reality behind these symbols. So on the basis of science or any symbolic activity at all, it will never be possible to expose the roots of being, and the question of whether there is an absolute reality even leads immediately to contradictions. Still, this does not mean that these roots do not exist: 'Everything that is relative must after all be rooted in an absolute'.¹⁷ Despite the inevitable contradictions, philosophical thought cannot do without its ultimate objective of discovering this absolute reality. Its only chance is to find an opening by charting the whole field of symbolic forms:

The paradise of immediacy is closed to it: it must—to quote a phrase from Kleist's article "On the Marionette Theater"—"journey round the world and see whether it may not be open somewhere in back [sic]." But this "journey round the world" must really embrace the whole of the *globus intellectualis*: [. . .] And since any attempt simply to transcend the field of form is doomed to failure, this field should be not merely touched upon here and there but traveled from end to end. If thought cannot directly apprehend the infinite, it should at least explore the finite in all directions.¹⁸

But it remains questionable whether access to reality in itself can eventually be found in that way, even if one assumes that the total *globus intellectualis* has been fully explored at some moment. Can time in itself, for example, be experienced, known and revealed in that way? Does it even exist? Cassirer leaves his readers in uncertainty on these and analogous questions. On the one hand, he sometimes suggests that our knowledge is connected in some way with an absolute reality, while on the other he apparently considers that,

¹⁷ Ibid., III, p. 35. This claim comes after a number of open though suggestive questions, and anticipates an outline of the philosophical programme of Bergson that Cassirer opposes. All the same, this quotation appears to reflect Cassirer's own view. His argument, however, is unconvincing; it is not the case that relative judgments always have to be based on an absolute.

¹⁸ Ibid., pp. 40–41.

although we can replace one symbolic system by another, we can never operate outside any system. So it remains unclear whether, and if so, to what extent time exists in itself, independently of any mental activity. The chapter on space and time in Cassirer's later work, *An Essay on Man* (1944), likewise fails to resolve the issue.¹⁹

Long before the Kantian programme was carried further in various schools, reaching its widest extension and maximal flexibility in the work of Cassirer, representatives of a more absolute kind of idealism had directly raised the question of the reality of time. The most important of these were the British philosophers F.H. Bradley and John McTaggart.

Bradley did so above all in his best-known work, *Appearance and Reality: A Metaphysical Essay*, which first appeared in 1893. It is divided into two parts: 'Appearance' and 'Reality'. In Part I it is argued that, upon closer inspection, all kinds of conventional ideas and representations turn out to be internally contradictory and therefore cannot be fully real. This criticism applies, for example, to movement and change, causality, the individual things and their primary and secondary properties, all qualities and relations, things-in-themselves, personhood, and—importantly—time and space, which are dealt with in a separate chapter.

A lot depends on the inconsistency that Bradley claims to see in every relation, among other reasons because any relation would lead to an infinite regression: every relation between two terms presupposes a different relation between itself and the terms involved on the basis of which the first relation holds, and so on. For space and time, he states, are essentially relational concepts. More in particular, time is the relation of prior to posterior, the relation 'earlier than'. Moreover, any attempt to determine adequately the elementary terms of this relation, the smallest units of time, leads to new dilemmas, and the same applies to the attempt to find time in the only thing that really seems to be there, namely the present.

Bradley classifies all these contradictory objects as appearances. That does not make them illusory, for they unmistakably exist in the quality of appearance, and by virtue of that they must even partake of absolute reality in some way or other: 'what appears is, and

¹⁹ Cassirer, *An Essay on Man*, ch. 4, esp. pp. 72–79.

whatever is cannot fall outside the real'.²⁰ What is more, this absolute reality consists only of what can present itself as appearance, even though it need not de facto have appeared and even though it exists within the Absolute at a higher level, where it is stripped of all relativity and contradiction. That Absolute is the subject of Part II of the book. Bradley's aim here is to show how it is possible that all the things that appear to us in a contradictory manner also partake of that single and eternal, unchanging and of course consistent Absolute. It happens; much more than that he cannot say, and at the end this absolute reality is even dissolved into 'our' criterium by which we judge appearances in different aspects.²¹ However, not all appearances are equivalent as appearances of the absolute reality. There are gradations here, and some appearances are closer to the absolute reality than others. Generally speaking, increased spiritualisation decreases the distance from the Absolute: 'Outside of spirit there is not, and there cannot be, any reality, and, the more that anything is spiritual, so much the more is it veritably real', as the final sentence of the book puts it.

One of the chapters in Part II tackles space and time again, but with much more attention for time than for space. Bradley elaborates the relativity of time even further by claiming that there may be different, unconnected temporal series, and that even the direction of time depends on us. But he also claims that it is possible for time to be absorbed by the higher absolute unity without entirely losing its temporal quality, which is transformed to become a part of an all-embracing harmony. And if that is possible, then it *is* so, for the contradictory appearances must simply partake of the absolute reality. 'The Absolute is timeless', Bradley concludes, 'but it possesses time as an isolated aspect, an aspect which, in ceasing to be isolated, loses its special character. It is there, but blended into a whole which we cannot realize. But that we cannot realize it, and do not know how in particular it can exist, does not show it to be impossible. It is possible, and, as before, its possibility is enough. For that which can be, and upon a general ground must be—that surely is real.'²²

²⁰ Bradley, *Appearance and Reality*, p. 123.

²¹ *Ibid.*, p. 489.

²² *Ibid.*, p. 185.

Time is suspended, continues to exist, loses its special character, but is still there: Bradley balances on the edge of contradiction, but he carries his readers with him thanks to his unshakeable trust in the necessity of the Absolute, to which all appearances that are contradictory in themselves belong in transformed form. Because these appearances are correlated with our perceptions and experiences, in other words must at least be able to form a part of them, even the Absolute seems to be connected with our consciousness. A fortiori this applies to the appearances themselves, in their untransformed, relative and contradictory quality. As such they can be experienced by a consciousness, and their relativity and contradictoriness are based on that capacity to be experienced. Time, as an appearance, is therefore clearly dependent on consciousness. And even time as an aspect of the Absolute still bears the marks of this origin with it. For nothing exists and nothing is real that cannot be experienced as an appearance, albeit distorted.

In the course of his discussion of the contradictoriness of time, Bradley had remarked: ‘Time in fact is “before” and “after” in one; and without this diversity it is not time’.²³ It is one of the contradictions that he claimed to be able to pinpoint in his characteristic, rather abrupt manner. It might be said that McTaggart’s famous and much discussed essay ‘The Unreality of Time’ is an elaborate attempt to localise the contradictoriness of time exactly, whereby the idea just quoted disappears, strictly speaking, only to return in another guise.²⁴

McTaggart’s argument is based on the distinction between two temporal series, two ways of placing and arranging events in time. In one series events are arranged in accordance with whether they are located in the past, present or future. The other series is that in terms of earlier, simultaneous, and later; in this series events are characterised as earlier or later than others, or as simultaneous. McTaggart called the first of these series the A series, and the second the B series. The most drastic difference between the two series

²³ Ibid., p. 34.

²⁴ The article was first published in *Mind* (1908). In 1927 it was incorporated (with minor changes) in McTaggart’s book *The Nature of Existence*, vol. II, ch. 33. It has often been reprinted in the last few decades, e.g. in Le Poidevin and MacBeath (eds), *The Philosophy of Time*, pp. 23–34.

is that changes take place in the A series, but not in the B series. After all, events are situated first in the future, then in the present, and finally in the past. So the truth value of statements of this sort may change, from true to false or vice versa. The relations of earlier, simultaneous or later, on the other hand, are not subject to any change. If it is true or false that X precedes Y or that they are simultaneous, that remains the case for ever.

Furthermore, McTaggart argues, the presence of change inside the A series implies an internal contradiction because it entails that one and the same event X can have three incompatible properties: first to be in the future, then to belong to the present, and finally to be past. Of course, it is easy to say that this is not a real contradiction because the incompatible properties are not simultaneous. What is valid simultaneously is, for example, that X *is* present, *was* future, and *will be* past, in other words, present in the present, future in the past, and past in the future. But McTaggart does not see this as a way out, because exactly the same applies to the moments that are introduced in order to eliminate the contradiction. They in turn have incompatible temporal properties, and if these are to be eliminated, an appeal has to be made to yet other moments so that triple predicates arise, such as present in the future in the past, and so on. So the contradictory properties can be eliminated, but always at the cost of new contradictions: there is no concluding procedure that resolves all the contradictions.²⁵

Thus the inconsistency lies here not in before and after, as it had for Bradley, but in the properties past, present and future that apply in relation to a changing point of reference. However, Bradley may have had the same thing in mind and used before and after to mean earlier and later than a moment in the flow of time, and thus a form of past and future. McTaggart, at any rate, drew a different conclusion, for he derived the irrealty of the A series directly from the contradictoriness of that series. And since only the A series is characterised by change and there can be no time without change, the B series, which is a temporal series after all, cannot exist either, now that the A series (and with it time) turns out not to exist. In both cases time is an illusion.

²⁵ Cf. the excellent analysis by Michael Dummett in 'A Defence of McTaggart's Proof of the Unreality of Time' (1960), later incorporated in his book *Truth and Other Enigmas*, pp. 351–357.

In fact, McTaggart had first argued that the B series cannot exist without the A series; it was only afterwards that he argued that the A series does not exist. These are the two main points of his reasoning. Many attempts have been made to undermine the force of this argumentation, but that is no easy task. Michael Dummett has shown that at any rate the conventional criticism of the latter argument will not stand up to scrutiny.²⁶ This criticism boils down to the charge that McTaggart fails to make the step to a non-self-referential account but remains confined within observer-dependent accounts. Dummett's defence of McTaggart can be summarised as follows. Let it be in principle possible to give an account of the successive events that take place somewhere in a part of space, i.e. a B series. That account could even be neutral, that is, independent of the standpoint of the observer, but in that case it can never be complete. In order to be complete, it must also indicate where in the succession the Now is located, and to that end the observer himself must be included in what is observed. This entails a second observer to whom the same applies, and so on. Time as something that progresses and is the basis of all change does not feature in such a neutral account of prior and posterior. At most, time has there become one of the dimensions of a four-dimensional representation of reality. Our awareness of progression and change, 'the movement of consciousness', in Dummett's words,²⁷ has disappeared and can only be included by appealing to the A series. But in that case the account is no longer independent of the observer. And since (Dummett proposes) McTaggart himself assumed that it must be possible to provide a full description of reality in a manner that is independent of the observer, he was forced to deny that time is real.

There were many more reactions, and especially from 1960 on McTaggart's A and B series formed the starting point for many discussions of time. It is curious to note that this contribution by a Hegelian thinker, albeit an idiosyncratic one, has had such a large influence on the analytical movement; I shall return to this in Chapter XVI.

McTaggart's conclusion that time proved in both cases to be an illusion turned out to be a tough nut to crack. It also implied that time

²⁶ *Ibid.*, pp. 353–354.

²⁷ *Ibid.*, p. 355.

is completely dependent on our consciousness, since without consciousness there would be no illusion. It met with opposition right from the start.

Of course, idealist views of time had come under fire before. By no means every philosopher in the post-Kantian period was convinced that time was in essential respects dependent on consciousness, no matter how powerful that Kantian tradition may have been. The view that time has a reality of its own, independent of mind, had certainly not died out, but was still expressed in more or less explicit forms.

Above all, this was to be expected in the materialist tradition, in which the dependence of anything, for example time, on consciousness was in principle anathema. Materialists took observable reality to be the true reality, including space and time; they were taken to have a fully objective existence, without any connection with human cognition or consciousness. No matter how much the materialists sometimes tended to speculate and carried out far-reaching extrapolations from selectively chosen scientific insights, this view of space and time was generally not meddled with.²⁸ Still, there was an alternative, for even the materialists could argue that consciousness is essential for the full existence of time. In their view, this would mean that matter must have first created consciousness before time can exist in the fullest sense. This possibility will be discussed in Chapter XV.

The most vigorous opposition to the dependence of time on the mind came from the New Realists. This movement, or rather this ensemble of movements, emerged at the end of the nineteenth century. Brentano was one of the initiators. There was an important branch in the United States, influenced by William James. The relation between mind and matter was the main theme of this branch, and a neutral monism à la Mach was the central idea shared by its members. New Realism in this sense also became established in England. Independently of that there was a realist revival in Oxford associated with Cook Wilson. The most prominent representatives of the entire movement, however, were Bertrand Russell and, for somewhat longer, G.E. Moore.

²⁸ On Moleschott, however, see F.A. Lange, *Geschichte des Materialismus*, II, pp. 37 and 94–101.

For a short time Russell defended an extreme form of referential realism: all expressions within meaningful, true statements refer to a real object. He took that to apply to logical terms and apparently to all time-related words as well, including ‘prior’ and ‘posterior’, ‘now’, ‘then’ and ‘presently’. In line with that he explicitly rejected Kant’s philosophy of time in *The Principles of Mathematics* (1903). Subsequently Russell gradually turned to logical constructivism: the attempt to reduce as many expressions as possible by logical means to a limited or elementary basis. Temporal terms were also the object of such a reduction.²⁹ By now he had abandoned his earlier extreme realism. On the main points he had become an empiricist, and will be mentioned in that role in Chapter XV.

Moore’s contribution to realism began with his pioneering essay, ‘The Refutation of Idealism’ (1903). More in particular, he here combated Berkeley’s claim that existence is equivalent to being perceived (*esse est percipi*), according to Moore the argument that *all* idealists appeal to in order to demonstrate the spiritual character of the world. Moore argued that the object of an experience is in fact often not a part of that experience. Consciousness and its object, for example a colour, are two distinct things; the latter is not a part of the former.

Is this also true of time and the experience of time? Probably, but not necessarily, for the experience of time takes place in time too. The equally programmatic article ‘A Defence of Common Sense’ (1925), however, leaves no room for doubt. It begins by listing a series of propositions of whose truth we are certain, and many of them relate to time and the progression of time, to present and past in the extra-mental world.³⁰

In the meantime Moore had also dealt systematically with the ontology of time in a series of lectures that he gave in London in the winter of 1910–1911. They appeared in a slightly revised form as *Some Main Problems of Philosophy* in 1953.³¹

²⁹ See ‘On the Experience of Time’, *Our Knowledge of the External World*, and above all the logical construction of instants in ‘On Order in Time’.

³⁰ His third manifesto in defence of realism was the article ‘The Proof of an External World’, included, like ‘A Defence of Common Sense’, in *Philosophical Papers*. It was perhaps the most controversial of the three.

³¹ Moore had already raised the question of the existence of time in his very first article, a contribution to a discussion of the question ‘In what sense, if any, do past and future time exist?’, published in 1897. His response was along the lines of F.H. Bradley.

Moore was primarily concerned here with the question that he regarded as the most interesting and important in philosophy, that of the existence of all things. In what forms and qualities are things found in the world? It boils down to Quine's question: What is there? In that connection, the question of existence *in* time and of the existence *of* time also arises.³² Moore subjects the arguments and views of Kant and Bradley to detailed critical analyses, interspersed with frequent and powerful appeals to common sense. For although in the last analysis he is concerned with finding out what it means to say that something does or does not exist, which problems arise in that connection and what the two philosophers might have meant, it is evident that Moore does not doubt the truth of our conventional temporal statements, for example that a certain event preceded another, that something took place a long time ago, or that something else may happen tomorrow. In general such statements are comprehensible and true for him, although it is difficult to say what they presuppose and exactly what they mean word by word. There is no question of any dependence on consciousness. McTaggart is not mentioned, but Moore's position is of course radically opposed to McTaggart's conclusions; Moore claimed that already as a student he had considered McTaggart's denial of the reality of time 'a perfectly monstrous proposition'.³³

The most important work to appear in those years in defence of the reality of time, however, was Samuel Alexander's *Space, Time and Deity*. It was first published in 1920, made a great impression, and went through several reprints within a period of fifteen years.³⁴ This book was a very curious and speculative exposition of philosophical realism, incorporating all kinds of influences: Spinoza, Leibniz, Kant, Bergson, Bradley and Moore, as well as insights derived from psychology, biology and physics.³⁵ Alexander regarded his system as a

³² *Some Main Problems of Philosophy*, esp. chs 9, 10 and 11, 'Existence in Time', 'The Notion of Infinity', and 'Is Time Real?'; but see also pp. 293–295.

³³ 'An Autobiography' in Schilpp (ed.), *The Philosophy of G.E. Moore*, p. 14; but see also note 31.

³⁴ Alexander, an Australian, assumed British nationality and was for many years Professor of Philosophy at the University of Manchester. For his views, philosophical position and influence see John Passmore, *A Hundred Years of Philosophy*, ch. 11.

³⁵ According to Alexander himself, in retrospect his system could be seen to have anticipated Whitehead's *Process and Reality* of 1929.

scientific system, albeit one of greater generality, and he presented it as a system of empirical hypotheses.

His most fundamental hypothesis is the claim that the ultimate quality of reality is space-time, the four-dimensional, infinite continuum of point-instants, whereby he also refers to pure (i.e. as yet non-material) motion. According to him, this is the material or stuff of which everything that exists is made. The following stages or levels of reality develop from this basis: first the properties and regularities of matter, then those of life, then the mind; and finally perhaps the divine will emerge. Each successive level emerges from its predecessor. It is not so much a new entity as the result of a new constellation of the preceding elements; strictly speaking, it is identical to such a constellation. This shows that the system is characterised by both a realist and a naturalist tenor. For example, Alexander does not see any gap between the mind and the related physiological and neurological events.³⁶ Nor does he make a distinction in principle between physical and mental space-time. On his view, the mind has not only a temporal but also a spatial character; it has direct contact with the spatial things it perceives (Alexander uses the term 'compresence' for this), and in itself it contains the space of the physical processes to which it owes its existence. Moreover, Alexander sees an analogy between the relation of body and mind, on the one hand, and that of any basis to the next level. Thus life is the 'mind' of matter, matter is the 'mind' of pure space-time, and its secondary properties are the 'mind' of its primary ones. However, this is a purely structural analogy and has nothing to do with consciousness. Consciousness only arises in the mind in the strict sense. In this way, the creative force (*nisus*) that Alexander postulated in order to explain the cosmic evolution he describes is present only unconsciously in space-time.

In the first instance, then, time does not exist independently of space, and vice versa. Space and time need one another: time needs

³⁶ His comments on this question are somewhat similar to the views expressed by John Searle in *The Rediscovery of the Mind*. See, for instance: '[. . .] in us mind is a new quality which belongs to physiological constellations of a certain kind, but these brain processes are in turn part of a vital body which exists as it were of its own right, in the sense that there are vital processes which have no quality of mind. A certain constellation of such vital processes has the quality of consciousness' (*Space, Time, and Deity*, II, p. 39).

space for continuity, space needs time for divisibility. Their separation is the outcome of an abstraction. With all that, time, together with and not separated from space, here forms the foundation of the world, long before there can be any question of consciousness. Time and space may be dependent on one another, but there can be no question of the dependence of either of them on mind, not even when Alexander calls time the 'mind' of space within that unity of space-time. The latter is based on an analogy that is in turn analogous to the body-mind analogy mentioned above. Alexander held the view that, within space-time, time has a function in relation to space that corresponds once again to the function of the mind in relation to the brain. That is not enough to make time a form of mind. On the contrary, for Alexander mind is a form of time, just as all emergent properties are a form of time in relation to the basic constellation which makes them exist. Surely, he seems to have attributed the creative force of the cosmic evolution within space-time more in particular to time.³⁷

Alexander had called upon his fellow philosophers to take time seriously. No doubt his own system satisfies this demand. Seldom or never has such a great metaphysical significance been attributed to time. Nevertheless, irrespective of how striking this position may be as the most ambitious realist counterblast to the idealist philosophies of time and of how many traditions are incorporated in it, it is understandable that it has not led to much. It has not influenced the development of the philosophy of time in the twentieth century noticeably. It certainly deserves more attention than it receives nowadays, but on the whole it is not an acceptable alternative.

³⁷ *Ibid.*, II, pp. 38–44. For the question of the relation between mind and time, see the Introduction by Dorothy Emmet, esp. pp. xii–xvii.

CHAPTER FOURTEEN

IN SEARCH OF AUTHENTIC TIME: BERGSON AND THE PHENOMENOLOGISTS

Bergson's dissertation 'Essai sur les données immédiates de la conscience' (translated as *Time and Free Will. An Essay on the Immediate Data of Consciousness*) appeared in 1889.¹ With this concise, rich and highly readable treatise he left his mark on the philosophy of time of his day. His following books, some of which achieved more fame, including *L'Évolution Créatrice*, made some additions to it, but the core of what he had to say about time—and perhaps of what he had to say about anything—had already been said in 1889. He once claimed that 'a philosopher worthy of the name has said only one thing'; if this dictum is applied to himself, that 'one thing' could well be his view of authentic time.

This idea is to be found especially in the second chapter of *Time and Free Will*. Here Bergson first argues that space is the abstract and homogeneous medium par excellence. For animals the various spatial directions are and remain unequal, but humankind has managed to conceive of such an abstract and homogeneous space. The spatial world in which people live is, of course, determined by all kinds of specific and heterogeneous properties, but in addition we also know an abstract, homogeneous space. Moreover, Bergson claims, this has enabled counting, and perhaps speech too. The opposite to this homogeneous reality is the non-homogeneous (heterogeneous) reality of concrete experience.²

Above all, the heterogeneous reality is characterised by authentic time: pure, genuine or real duration (*durée*). This duration forms a

¹ It was one of the two theses required for a doctor's degree. The other was on Aristotle's views on place.

² 'What we must say is that we have to do with two different kinds of reality, the one heterogeneous, that of sensible qualities, the other homogeneous, namely space. This latter, clearly conceived by the human intellect, enables us to use clear-cut distinctions, to count, to abstract, and perhaps also to speak' (*Time and Free Will*, p. 97). For Bergson's argumentation on the decisive importance of spatial coexistence for the development of the concept of number, see pp. 75–87.

pre-eminently heterogeneous whole of qualitative situations and changes which all differ from but interpenetrate one another. Like any collection of spatial elements, duration too contains a plurality of components. But the plurality of duration is radically different from that of space: it is not divisible, numerable or measurable. Changes occur in it, and these changes even move unmistakably in one specific direction, but according to Bergson the different situations cannot be considered together as a series without doing violence to duration.³ For in order to do so, he argues, it is necessary to appeal to space; in that case these situations have to be juxtaposed, symbolically represented in space. Of course, that is common enough. Thanks to space, we have also developed a homogeneous and quantitative notion of time that apparently enables us to measure duration and that stands us in good stead in everyday life and in science. When we talk about time, we usually mean this homogeneous surrogate, and forget the original, heterogeneous duration. However, it is tantamount to a falsification of this duration.⁴

This homogenised and spatialised time is thus, like homogeneous space itself, a human product, more in particular a product of the human intellect. They would not be there without the capacity for abstraction of the intellect. Moreover, for time and duration taken together there is an even more fundamental dependence on consciousness in play, for Bergson remarks that reality knows no change without consciousness. Even a clock, the instrument par excellence for measuring time, does not measure the passage of time without the consciousness of the observer. Independently of that consciousness, there is always just one position of the hand and the pendulum, without past or future. 'Now, let us withdraw for a moment the ego which thinks these so-called successive oscillations: there will never be more than a single oscillation, and indeed only a single position, of the pendulum, and hence no duration. Withdraw, on

³ Ibid., p. 100.

⁴ Ibid., p. 91. For Bergson the past is the primary component of time. His slightly older contemporary J.M. Guyau, on the other hand, argued in his posthumously published *La genèse de l'idée de temps* (1890) that the basis of the notion of time is formed by conation and anticipation; for him the future is the primary component of time. However, this is more of a psychological than a metaphysical or ontological theory. It belongs to the (pre)history of cognitive psychology. See Michon (ed.), *Guyau and the Idea of Time*, pp. 161–197.

the other hand, the pendulum and its oscillations; there will no longer be anything but the heterogeneous duration of the ego, without moments external to one another, without relation to number. Thus, within our ego, there is succession without mutual externality; outside the ego, in pure space, mutual externality without succession [. . .].⁵ With regard to movement, this means that we can place the corresponding trajectory outside us in space, but that movement itself is a question of mental synthesis, not a physical but a psychological and thereby non-spatial process.⁶

So without consciousness there is no temporal succession and no duration at all. Duration is experienced pre-eminently in consciousness by the intuition. It has nothing to do with the intellect. Unlike the Neo-Kantians discussed in the previous chapter, and totally unlike the empiricists discussed in the following chapter, Bergson did not regard physics as an important source for the philosophy of time.⁷ He did not deny the practical importance of science and the intellect, but he held that deeper insight can only arise from intuitive reflection on what takes place in our consciousness.

It is true that in his later writings Bergson widened the scope of pure duration. He took duration to operate in the unconscious as well and to function as the foundation of the memory of all that has happened to us, of pure memory (*le souvenir pur*); it would also be the basis of creative evolution in living nature, of the vital force (*élan vital*); and even control the development of the cosmos as a whole.⁸ But it is questionable whether this means that pure duration can also exist without any form of mind or consciousness, for in all these cases duration lies outside matter as that is investigated and described by scientists, even outside the domain of the intellect. When Bergson claims that duration is also the foundation of these processes, this means that in the course of his oeuvre he delimits a larger and larger spiritual area within reality as the sphere of operation of pure

⁵ *Time and Free Will*, p. 108. Cf. also p. 119.

⁶ *Ibid.*, p. 111.

⁷ In his *Durée et simultanéité. A propos de la théorie d'Einstein* (1922) Bergson did make an attempt to establish a connection with Einstein's theory of relativity, but he was later to regard that attempt as unconvincing.

⁸ See *Matière et mémoire* (1896); *L'Évolution créatrice* (1907); *Durée et simultanéité* (1922). On these and other functions of duration cf. E. Levinas, *Dieu, la mort et le temps*, pp. 65–67.

duration. In this way the enlargement of duration is accompanied by an enlargement of the mind, both internally (the unconscious) and externally (life and matter). In the case of the vital force (*élan vital*), Bergson even refers explicitly to a higher consciousness that is taken to be operative here. So all in all, there seems to be no reason to doubt the dependence of duration on mind.

However, the concept of pure, veritable duration is not without its problems. Critics have often pointed out that the notion of successive but mutually interpenetrating and essentially indistinguishable stages is contradictory. Bergson was not impressed. After all, he already suspected that our language arose on the basis of abstract space and is thus a product of the intellect. He therefore accepted in advance that a correct formulation of intuitions is impossible. A fortiori this applies to intuitions concerning duration. So talking about authentic time did not have to satisfy the norms of the intellect.

Edmund Husserl, who was originally a mathematician and wanted his philosophy to be a strict science based on rational methods, saw things differently. Nevertheless, like Bergson he assigned no place to physics in his notion of time. The core of his view is contained in a series of lectures from the beginning of 1905 on the phenomenology of the consciousness of time, the last part of a course entitled 'Hauptstücke aus der Phänomenologie und Theorie der Erkenntnis'. Slightly more than a decade later his assistant at the time, Edith Stein, edited (with Husserl's collaboration) the notes for these lectures and a number of other notes to produce a publishable text. Another ten years later, in 1928 (one year after the publication of Heidegger's *Sein und Zeit*), this work, largely prepared by Edith Stein, was published in an edition by Heidegger under the title *Husserls Vorlesungen zur Phänomenologie des inneren Zeitbewusstseins*.⁹

From the start, Husserl distances himself not only from physics but also from a psychology orientated towards the natural sciences. In accordance with the phenomenological programme that he was

⁹ The genesis of this work is described in the editor's introduction. Together with various supplementary texts, it constitutes Vol. X of Husserl's *Gesammelte Werke* in the series of *Husserliana*. An English translation of this volume with an illuminating introduction by John Barnett Brough was published in 1991. Since that translation indicates the original German pagination, all page references are to the German edition.

developing at the time, all assumptions and beliefs regarding the field under investigation have to be suspended. Husserl even goes so far as to consider 'objective time' irrelevant to his investigation. His explanation is that objective time is not a phenomenological given: 'Just as the actual thing, the actual world, is not a phenomenological datum, neither is world time, the real time, the time of nature in the sense of natural science and even in the sense of psychology as the natural science of the psychic'.¹⁰ He leaves it up to others to investigate the connection between the content or the object of the consciousness of time and objective time if they so wish, but all in all he considers that the phenomenological analysis of the consciousness of time cannot teach us anything about real, objective time: 'One cannot discover the least thing about objective time through phenomenological analysis'.¹¹ After all, 'sensing' (*Empfindung*) the phenomenologically given *temporal data* is something very different from the perception of objective *Tempora*; even the absolutely given Now is not yet the objective Now.¹² This would mean that for Husserl real time is not dependent on consciousness at all: this real time is taken to exist by itself, and in principle the consciousness of time has nothing to do with it.¹³

However, things are not as simple as that. To start with, although Husserl takes objective time to exist outside the consciousness of time (it is transcendent vis-à-vis this consciousness), that does not alter the fact that it appears to consciousness. Moreover, the consciousness of time *is* orientated towards this objective time; the latter is meant or intended by the former. And finally: precisely because phenomenological analysis, in focusing radically on the essence of the phenomena, brackets individual and empirical consciousness, through this analysis the origin of time as well as its a priori regularity can be discovered. This already appears in the second section, 'The Question about the "Origin of Time"'. Surprisingly enough, after what has gone before, the discussion is of time itself, not the consciousness of time. The question of the essence of time is here taken to lead back to the question of the 'origin' of time, a question that in turn is

¹⁰ Husserl, *On the Phenomenology of the Consciousness of Internal Time*, p. 4; cf. also p. 9.

¹¹ *Ibid.*, p. 6.

¹² *Ibid.*, pp. 6–8.

¹³ *Ibid.*, pp. 5–6.

taken to relate to 'the primitive formations of time-consciousness'. The consciousness of time proves to constitute both the source and the essence of time itself.¹⁴

Husserl is here apparently still wrestling with the formulation of the programme of transcendental phenomenology that he developed in the years 1905–1910, and that was systematically expounded in 1913 in Part I of *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie*.¹⁵ A further complication is the genesis of the work: as mentioned above, the treatise on the consciousness of time was put together on the basis of notes from different years. The advantage, at any rate, is that the reader can see that programme appearing at an accelerated rate. Within the space of ten pages, Husserl develops as it were from a dualistic realist (who recognises the autonomous existence of both the subjective consciousness and the objective, external world) to an idealist (for whom the consciousness forms the foundation of the external world). In the latter case, consciousness eventually has to be conceived as an impersonal, transcendental consciousness; the objective world, in this case objective time, is designed and constituted as such by the activity of consciousness. Indeed, one might wonder: Is it not the case that the phenomenological programme, as the attempt to give philosophy a new foundation by describing how the immanent phenomena of consciousness may bear on objects that transcend consciousness, only makes sense if a strong form of idealism is embraced?¹⁶

Once again, however, this is not the last word. The two positions just described indicate the limits within which Husserl's ontology moves in this monograph. The ambiguity is perhaps not always as clear as in the two introductory sections, but it still comes to the surface often enough. The range of concepts deployed already encouraged that. A central place was occupied by the concept of 'constitution'.

¹⁴ *Ibid.*, pp. 8–10. These and other contradictions discussed below can be partly explained by assuming that Husserl sometimes argued from a phenomenological and sometimes from a natural position. That by no means always yields a satisfactory solution.

¹⁵ The later parts of this work were published posthumously.

¹⁶ That the Husserlian phenomenological programme is inconceivable without some form of transcendental idealism is the main theme of Herman Philipse's extensive and illuminating discussion 'Transcendental Idealism' in Smith and Smith (eds), *The Cambridge Companion to Husserl*, pp. 239–322. That is also how Husserl himself saw it, only some of his pupils thought differently.

What is constituted by acts of consciousness is in the first instance what appears in them, what they bear on, what is intended by them. But the term is often used in a stronger sense to mean a form of bringing about. ‘How, in addition to “temporal objects”, immanent and transcendent, does time itself—the duration and succession of objects—become constituted?’, Husserl asks, for example, and on the same page he notes briefly: ‘Since objective temporality always becomes constituted phenomenologically [. . .]’. This points clearly in an idealist direction. However, the continuation, ‘and stands before us in appearance as an objectivity or as a moment of an objectivity only through this constitution’, considerably tones down that idealism, even though it is true that an appearance can only occur in the presence of consciousness.¹⁷

The reader is thus given a number of different starts within a few pages, and it remains to be seen which of them are false starts. The complications connected with the concept of ‘constitution’ are not the only ones. Apart from them, Husserl writes here often enough about the relation between an experience of consciousness and an independent event that takes place outside it to nourish doubts about his idealism.

One of the specific topics discussed extensively by Husserl is the problem that was also raised by Bergson (and much earlier by Augustine and Locke), that of how a continuing situation or a process of change can be perceived. Bergson had appealed to the duration of our consciousness, where prior can be present in posterior and vice versa. Husserl does not mention this solution, but he does refer to the responses by Brentano, Herbart, Lotze and Stern. In each case consciousness has to be able to transcend the impressions of the momentary present in some way, for the continuation or the succession of impressions in itself is still by no means the impression of a continuation or a succession. Sometimes the answer was sought in a comprehensive cognitive capacity within which the course of time is suspended (Herbart, Lotze), sometimes in an extended present, a ‘psychic presence-time’ (William Stern; in a certain sense this

¹⁷ Husserl, *op. cit.*, pp. 22–23. It looks as though at first Husserl preferred to speak of objects that constitute themselves in consciousness, while later he preferred to say that they are constituted in consciousness or that consciousness constitutes them.

is an expansion of William James' notion of the 'specious present'), or sometimes in the imagination (Brentano, who regarded the 'original association' as a form of *Phantasie*).¹⁸ Husserl discusses these solutions critically, going into Brentano's in the most detail, before presenting his own solution.

Husserl believes that the perception of duration or change is based on a particular form of memory, the so-called 'primary memory' or 'retention'. This retention ensures that earlier perceptions remain in consciousness and form a part of perception in the wider sense, even though as memories of something that already belongs to the past they have a separate character. This, he claims, is how we perceive a melody or a sustained note, for example. This primary memory is essentially different from the secondary memory which calls up something from the past and reproduces it in consciousness.¹⁹

Retention and reproduction both play a role in the constitution of the temporal objects and of time itself, and so, of course, do the momentary impression (*Impression*) and expectation (*Erwartung*). In principle, Husserl distinguishes three main levels within this process: the basic level of the absolute time-constituting flow of consciousness; the consciousness-immanent elements in internal, subjective, pre-empirical time; and the things of empirical experience in objective time that transcend consciousness.²⁰

The absolute flow of consciousness is an elementary given. It consists of pure progression and pure change, without there being anything that progresses, changes, or even endures. 'There is nothing here that changes, and for that reason it also makes no sense to speak of something that endures.'²¹ It is no wonder that elsewhere he even speaks of the absolute, *timeless* consciousness.²² While for Bergson duration as the flow of consciousness is always filled with

¹⁸ Brentano had not yet published this idea in 1905. It was recorded by others, particularly Anton Marty and Carl Stumpf. However, there are references to it in several of Brentano's later, posthumous works, in particular in new editions of *Psychologie vom empirischen Standpunkt* and in *Philosophische Untersuchungen zu Raum, Zeit und Kontinuum*.

¹⁹ Husserl's solution is reminiscent of Augustine's notion of the extension of the mind.

²⁰ Husserl, *op. cit.*, p. 73.

²¹ *Ibid.*, p. 74.

²² *Ibid.*, p. 112.

concrete contents, for Husserl this flow is completely empty and basically stands still.²³ All the same, Husserl's distinction between objective time and the absolute flow of consciousness recalls Bergson's between abstract time and real duration, and Husserl probably thought so too. At least, he seems to have said to one of his students: 'We are the consistent Bergsonians'.²⁴

Within his absolute and timeless flow of consciousness, the immanent elements constitute themselves in diverse stages, and these are subject to duration and change. They exist in the one, immanent time that is constituted together with them, and they are characterised, for instance, by simultaneity and durations of equal length.²⁵ Finally, this immanent time leads to objective, real time. In fact, they are both identical. Phenomenologically speaking, the second and the third level coincide. Thinking of any extent of immanent time as real time makes it ipso facto an extent of real time.²⁶ It could not be otherwise, Husserl argues, because it is a priori the case that everything partakes of the same flow of time, 'and that the objectivated absolute time is necessarily identically the same as the time that belongs to sensation and apprehension'.²⁷

The gap between the immanent time of consciousness and the real time of the external world to which Husserl referred at the start of his argument thus does not exist at all. Immanent time inevitably gives us real time. Since Husserl argues this with the consideration that the former inevitably partakes of the latter, this does not in itself have to mean that the latter is dependent on the former. Rather, he suggests here that there is an objective time outside consciousness, to which subjective time is naturally subjected. In that case a realist interpretation forces itself on the reader. However, a different impression is often created, and perhaps it is already symptomatic that in the passage just quoted the word 'objectivated' is used instead of 'objective'. If so, Husserl talks as though the process of constitution is the foundation of time. In that case, it seems, the single,

²³ 'The flow of the modes of consciousness is not a process; the consciousness of the now is not itself now' (ibid., p. 333).

²⁴ Theo de Boer, *The Development of Husserl's Thought*, p. 463 n. 38.

²⁵ Husserl, op. cit., p. 76.

²⁶ Ibid., p. 71, lines 6–9.

²⁷ Ibid., p. 72.

objectivated time would be completely dependent on consciousness. And in that case, an idealist interpretation is the most natural.²⁸

A comparison might be made with the system of constitution that Rudolf Carnap developed in his first major work, *Der logische Aufbau der Welt* (*The Logical Structure of the World*), also published in 1928. In this work, Carnap outlines a derivation of all empirical notions, including, of course, those of time and space, from a basis of elementary, autopsychological (*eigenpsychische*) data. His basic data are the so-called elementary experiences (*Elementarerlebnisse*), a person's momentary total and undivided experiences; the only fundamental concept is a certain relation that can exist between two such elementary experiences, the recollection of similarity (*Ähnlichkeitserinnerung*). It looks like solipsism, but Carnap remarks that he is only concerned with a methodological solipsism, not an ontological or metaphysical one. He does not state anything about the structure of reality, but only about a possible structure of the system of our concepts, a structure that can be replaced by others and that he himself was to abandon later.²⁹ Husserl too advocates a method, the phenomenological one, but did not limit himself to it à la Carnap, nor is there any doubt that Husserl's ambitions would go beyond a conceptual (re)construction. He is interested in the real foundation of the objects of consciousness and of our knowledge of them, not just in a possible derivation of the concepts that we deploy in relation to those objects. *His* constitution system is at the service of an ontology.³⁰

This ontology is somewhat ambiguous in Husserl's book on the consciousness of time: it is idealist in important respects, but often realist too. In other works whose origins date from later, this doubt recedes more and more into the background. An extremely important source for insight into Husserl's developments is formed by the five lectures that he gave in 1907 under the title 'Die Idee der Phänomenologie'. They formed the introduction to a new *Hauptstücke*

²⁸ It is thus understandable that some exegetes have declared the distinction between idealism and realism to be irrelevant for the explanation of Husserl's position.

²⁹ By the way, there is initially no Ego involved in his system; that only comes later. Strictly speaking, it is only in retrospect that one can determine that the basis is *eigenpsychisch* and not intersubjective or physical.

³⁰ Nevertheless, Carnap saw important similarities between his constructional system and that of Husserl; cf. *The Logical Structure of the World*, section 65.

series, this time the ‘Hauptstücke aus der Phänomenologie und Kritik der Vernunft’ (1907). Husserl had already written and spoken about phenomenological reduction and about constitution in 1905, but it is in the five lectures of 1907 and the summary that was added to them that these concepts first appear in full clarity. He now distances himself definitively from the conception of phenomenology as a form of descriptive psychology (the stage of the *Logische Untersuchungen*), is no longer satisfied with the reduction that he was later to call eidetic (the elimination of all that is individual and the orientation towards the essence of things, the *Wesensschau*), and introduces phenomenological reduction. This is the method in which everything that transcends consciousness is bracketed: the outside world and one’s own person, body and soul. All this (Husserl uses the loaded term ‘transcendent’ for it) is put aside, ‘is to be assigned the index of zero’; it is the famous *epochē*.³¹ So what remains are not the person-related components of consciousness, but the phenomena of the pure, absolute, transcendental consciousness. The result is not *real* immanence either (defined in terms of what in reality is left after this reduction), but what Husserl calls *intentional* immanence: it is intentional because the objects towards which these phenomena are orientated also belong to them. Husserl argues step by step that the general essences and the transcendent things or objectivities (*Gegenständlichkeiten*) appear in these phenomena and can be their intended object. What is *really* transcendent vis-à-vis the *really* immanent has (to some extent) become *intentionally* immanent. Husserl even speaks of ‘pure self-giveness’. That is the only way in which these essences and things can be known, indeed, it is the only way in which they exist. They are there only because they are constituted in and by the transcendental consciousness:

[. . .] “constitution” means that things given immanently are not, as it first appeared, in consciousness as things are in a box, but rather that they present themselves in something like “appearances”, in appearances that are not themselves the objects, and do not really contain the objects, appearances that in a certain sense create objects for the ego in their changing and highly peculiar structure [. . .]. The *original object of time* constitutes itself in perception and the retention that belongs to it. Only in such a consciousness can time be given.³²

³¹ Husserl, *The Idea of Phenomenology*, p. 6 (pagination from *Husserliana* II).

³² *Ibid.*, p. 71.

‘Something like’, ‘given’—it is still not entirely free of ambiguity, even though at the end Husserl emphatically states: ‘Rather, in givenness we see that the object constitutes itself in knowing [. . .]. And it is only in these connections that the objectivity of the objective sciences, and above all the objectivity of real spatial-temporal actuality, constitutes itself—not in one blow, but in a gradually ascending process’.³³

Around 1910 the idealism of Husserl’s phenomenology has become unmistakable.³⁴ More in particular, it now appears that time is constituted in the absolute consciousness, in such a way that the time of the real world is also dependent and based on that consciousness. This dependence on consciousness must in a certain sense apply to time par excellence, since phenomenological time is ‘a universal peculiarity of all mental processes (*Erlebnisse*)’.³⁵

And yet! Soon after remarking in *Ideen* that experiences are subjective, on the one hand, and *ich-abgewandt*, i.e. have an ‘objectively oriented side’, on the other, Husserl draws a clear-cut distinction between phenomenological time and objective or cosmic time. Certainly, the latter appears in the former, and transcendent time is known in the transcendental consciousness of time. For a more thorough discussion, Husserl refers in a note to his 1905 lecture on the subject, but unlike then, he now considers that this consciousness of time no longer partakes of cosmic time as a result of the phenomenological reduction. Immanent and transcendent time, he states, have no ‘oneness of essence’ (*Wesenseinigkeit*).³⁶ These two seem strikingly distant from one another here; transcendent time has become

³³ *Ibid.*, p. 75. For a strong, perhaps even stronger view of constitution, see pp. 13–14, at the end of the resumé of the lectures entitled ‘Gedankengang der Vorlesungen’ (The Train of Thought in the Lectures). The step by step and complicated process of constitution is later analysed thoroughly in *Ideen*.

³⁴ On the transitional years, and in particular the interpretation of *The Idea of Phenomenology*, see the study by Theo de Boer, *op. cit.*, pp. 303–323; cf. also pp. 397–415. De Boer claims that many discussions of Husserl’s idealism or realism are misleading because irrelevant forms of them are used. According to De Boer, Husserl had indeed become an idealist, though in his own way. Perhaps one might say that for Husserl consciousness and external world were in the last instance one another’s correlate, one another’s mutual condition, and not that one was the condition of the other. However, De Boer barely touches on Husserl’s philosophy of time, though see p. 415.

³⁵ *Ideen*, p. 161.

³⁶ *Ibid.*, pp. 161–164.

extremely transcendent, and it is no longer clear how it can be constituted in consciousness. Did Husserl retreat from the idealist consequences of his method? And if so, was that because of his attachment to reality as we commonly experience it, his (albeit conditional) respect for the natural order of things?³⁷ It is noteworthy that in *Ideen* he barely discusses time at all, even though in his view it was of such general importance; he considered it an isolated subject that could be dispensed with here. That is why it is difficult to determine how significant these isolated remarks are, and what exactly they should be taken to mean.³⁸

So despite the unmistakable idealist turn in Husserl's philosophy, his view of the problem of the relation between time and consciousness is in the last instance unclear. The situation with regard to his pupil Heidegger is different. In his great work *Sein und Zeit* (1927), the presentation of *Dasein* as being-in-the-world suspends a priori the split between subjectivity and the external world. So all kinds of questions that may arise in relation to Husserl's philosophy of time that are related to this split are not to be found in Heidegger, though of course this does not alter the fact that there are still important similarities.

Heidegger was keenly interested in time right from the start of his career. His *Habilitationsvortrag* 'Der Zeitbegriff in der Geschichtswissenschaft' (1915) is evidence of that. In 1924 he gave a lecture on 'Der Begriff der Zeit', and soon afterwards he published a treatise with the same title. In 1925 he gave a course on the history of the notion of time. This all culminated in *Sein und Zeit*, intended as the

³⁷ Cf. the commentary and anecdotes in Helmuth Plessner, *Husserl in Göttingen*, pp. 17–22.

³⁸ The idea that objective, cosmic time might be a sort of thing-in-itself vis-à-vis the pure consciousness must be immediately rejected, however, for Husserl had given up that idea a long time before. He called it a mystical notion; see e.g. *The Phenomenology of the Consciousness of Internal Time*, p. 6. Husserl does refer to the analogy of space and time; he went into space in more detail in a lecture of 1907, 'Phänomenologie der Dinglichkeit und insbesondere der Räumlichkeit', later published in *Husserliana XVI*. The hesitations and changes in Husserl's ontology of time are summarised in Robert J. Dostal, 'Time and Phenomenology in Husserl and Heidegger', in C.B. Guignon (ed.), *The Cambridge Companion to Heidegger*, pp. 148–149. See further the extremely detailed description of Husserl's analyses from 1904 to the early 1930s, partly based on as yet unpublished manuscripts, in the dissertation by A.T.M. Kortooms, 'Fenomenologie van de tijd. Edmund Husserls analyse van het tijdbewustzijn'.

first half of a larger work; it is dedicated to Edmund Husserl 'in friendship and admiration'. In 1927 he also gave a series of lectures that he explicitly referred to as an elaboration of one of the unpublished parts of *Sein und Zeit*. A few years later the friendship and admiration for Husserl were over, and Heidegger began to lose interest in the question of time.³⁹

The lecture 'Der Begriff der Zeit' was not published until 1989, on the basis of two extant sets of notes. Heidegger is here searching for 'authentic temporality', as distinct from natural time or world time. He finds it in human existence (*Dasein*) and briefly deals with a few of its fundamental structures. This leads him to state that, understood in its extreme possibility of being, *Dasein* is not *in* time, but is time *itself*. This extreme possibility of being concerns death, at least the certainty and the anticipation (*Vorlaufen*) of death. That makes the future the basic phenomenon of time; it is only from there that present and past acquire their real meaning. Although in daily practice we move in the sphere of the 'they' and in 'they-time' (*Manzeit*), the real *Dasein* is still *my Dasein*, with *my* death, and real, authentic time is thus one's *own* time.⁴⁰

In retrospect, this lecture was a small guide for the famous work of 1927, which already provided the table of contents of the entire work envisaged by Heidegger. It contained the extensive introduction on the question of the meaning of being (which was, in the last resort, Heidegger's concern), and the first two of a total of three Divisions of the first Part. The third Division of Part I and the entirety of Part II never materialised, and since 1953 the words 'First Half' have been removed from the title page.

Even so, there is enough here on Heidegger's view of time. The first Division contains the analysis of *Dasein* to which Heidegger owes most of his fame. A few core elements of that analysis are: *Dasein* as being-in-the-world, as being-with and as being-one's-self (*Selbstsein*); things at hand (*Zuhandenheit*) and objective presence (*Vorhandenheit*); the role of the they (*das Man*); mood, understanding, fallenness, thrownness; the fundamental attunement of dread (*Angst*); and the being of *Dasein* as care. The essentials had already been

³⁹ The reason was probably that he no longer considered *Sein* on the basis of *Dasein* alone.

⁴⁰ Heidegger, *Der Begriff der Zeit*, esp. pp. 15–19, 22, and 25–26.

indicated in 'Der Begriff der Zeit', but here all are presented not only much more fully but also much more incisively. After more than seventy years it is still easy to understand how this book, especially because of its first Division, has become *the* basic text of twentieth-century existentialism. The second Division, 'Dasein and Temporality', is devoted to time. The coherence of all the structural characteristics of Dasein is taken to be based on its temporality.

What is said in the first Division about space, however, is already a step towards the later discussion of time. Heidegger notes there that spatiality is an essential aspect of being-in-the-world. What is at-hand as we go about our everyday business is naturally near by, and is the opposite of everything that is further away. But there is more to it than that. Dasein has the tendency to bring what is far away closer and thereby to have more and more at its disposal. 'An essential tendency toward nearness lies in Dasein', as Heidegger puts it. He refers in this connection to modern developments such as the increasing speed of traffic and the use of the radio. Above all, he derives it from the German word *Entfernung* (distance). For does this word not suggest that what is so-called in the distance is subject to a process of abolition of distance (*Ent-fernung*)? 'Dasein is essentially de-distancing: as the being that it is, it lets beings be encountered in nearness'.⁴¹ So that is what the spatiality of Dasein looks like; it is essentially an abolition of distance, a removal of being removed. According to Heidegger, *abstract* space is based on this primary spatiality, but for that the things must be detached from the world to which they originally belong. Only then do they acquire their place in an abstract system of dimensions in which the environment becomes the world of Nature and everything that is at hand is merely regarded as objectively present.⁴²

The situation with regard to time is the same and different: the same, because there is also a real or original time in which a form of approaching and coming closer operates and from which everyday time and physical time are derived; different, because the tem-

⁴¹ *Sein und Zeit*, p. 105. Since the English translation by Stambaugh (and the older translation by Macquarrie and Robinson) also gives the German pagination, there is no need to refer to it separately. In my citations I follow Stambaugh, except for the spelling of Dasein as Da-sein.

⁴² *Ibid.*, p. 112.

porality of existence has an even more fundamental character than spatiality, such that spatiality is marked by temporality, but not the reverse.

Heidegger develops his notion of time from 'being-toward-death'; this forms the core of care, and he discusses it immediately in the first chapter of the second Division. 'Death is the *ownmost* possibility of Dasein': a possibility that is at the same time an impossibility because it puts an end to existence, but is no less *the* condition of the being-a-whole (*Ganzsein*) of Dasein.⁴³ The 'they' pay no heed to that. They are concerned about death, but in an unauthentic form of evasive concealment. The real or authentic relation to death is characterised by the anticipation of death, in which authentic Dasein draws its own death towards itself (Heidegger speaks of 'coming nearer understandingly') and thus tears itself radically loose from the 'they'.⁴⁴

This gives Heidegger the foundation of his view of time, the key passages of which can be found in sections 65 and 66. For instance, he writes: 'Only because Dasein is determined as temporality does it make possible for itself the authentic potentiality-of-being-a-whole of anticipatory resoluteness [. . .]'.⁴⁵ The anticipation of death as the intimate and ultimate possibility of Dasein means, moreover, the priority of the future within time: future not in the sense of a now that has not yet become 'actual', but of a happening future as coming toward (*Zu-kunft*), in which Dasein comes toward itself. But in this anticipation, Dasein has already 'been'; 'Anticipation of the most extreme and ownmost possibility comes back understandingly to one's ownmost *having-been*'.⁴⁶ Thus the authentic future implies the authentic past. But the authentic present is also at stake since the resoluteness (*Entschlossenheit*, taken also to mean disclosedness) can only be what it is as present (*Gegenwart*), i.e. making present (*gegenwärtigend*). While the authentic future is characterised by 'toward-onself', the authentic past is characterised by 'back-to', and the authentic present by 'letting-onself-be-encountered-by'. In each of these cases,

⁴³ Ibid., pp. 262–263.

⁴⁴ Ibid., p. 262; see further sections 52 and 53.

⁴⁵ Ibid., p. 326. The conclusion runs: 'Temporality reveals itself as the meaning of authentic care' because authentic care is being-toward-death.

⁴⁶ Ibid., p. 326.

temporality is based on a form of ‘outside-of-itself’ and thus in that sense has an ecstatic character.⁴⁷

Here lies the basis of all temporality, a basis that in no respect *is*, but temporalises itself. In the first instance that is the primordial and qualitative time with the three ‘ecstasies’ of present, past and future, and in the second instance what Heidegger called the vulgar, quantitative notion of time. Upon closer inspection, the latter has two forms: the practical time-reckoning of being-with and of the encounter with the things at hand; and the abstract, levelled series of Nows. This series of Nows, partly already past, partly still to come, is infinite. Primordial temporality, on the other hand, is finite because temporalisation is finite.⁴⁸

In the three following, last chapters Heidegger shows in detail how temporality relates to everyday life, to historicity, and to inner-worldliness (*Innerweltlichkeit*). The latter term refers to beings that are in the world. Time-reckoning belongs to the being-in-the-world of Dasein, and for that the common and traditional notion of time is required. With its help, the other beings are made accessible as ‘existing-in-time’ and have their within-time-ness (*Innerzeitigkeit*). Although this is an unauthentic time that is not itself based on the future as coming-toward (*Zu-kunft*), it arises from the primordial temporality and is therefore still ‘a genuine phenomenon of time’, not ‘an externalisation of a “qualitative time” into space’, as it was for Bergson.⁴⁹ For Heidegger, it is not that a part of time is swallowed by space; rather, the spatiality of Dasein turns out to be characterised by temporality.⁵⁰

Are this Heideggerian temporality and its derivatives dependent on consciousness? As far as the published part of *Sein und Zeit* is concerned, the answer is a virtually unconditional ‘yes’. It is true that Heidegger avoids the term ‘consciousness’ as much as possible, but a large part of the treatise is nevertheless concerned with it. The term is probably avoided mainly because almost automatically, and

⁴⁷ Ibid., pp. 325–326 and 328–329. For a discussion of the main lines and special character of Heidegger’s philosophy of time, see Duintjer, *De vraag naar het transcendente*, ch. IV, esp. pp. 194–198 and 238–250. Cf. also Karin de Boer, *Thinking in the Light of Time*, pp. 47–48.

⁴⁸ Ibid., pp. 333 and 329–330.

⁴⁹ Ibid., p. 333.

⁵⁰ Ibid., section 70, pp. 367–369.

especially in the tradition of Husserlian phenomenology, it suggests a gap between inner and outer world; for the same reason Heidegger also avoided the term 'subject'. His conception of Dasein as being-in-the-world was designed precisely to do away with that gap.⁵¹ That does not yet mean, however, that consciousness is not constantly implicit, for almost nothing of what Heidegger says about Dasein is understandable unless it is taken to mean a *conscious* being, right from the definition 'Dasein is a being which is concerned in its being about that being',⁵² via for example mineness (*Jemeinigkeit*), mood and care, to being-toward-death. More in particular, the anticipation of death, the coming-toward oneself and the returning to oneself presuppose a developed consciousness and self-consciousness. The ontological difference between Dasein and non-Dasein, between history and nature (what Heidegger calls the ontological *Unterschied*, as distinct from the ontological *Differenz* between Being and beings), is a question of consciousness. Without Dasein there can be no temporality or time, but there can be no Dasein without consciousness.

At most it might be objected that in *Sein und Zeit* it is temporality, not Dasein, as in the 1925 lectures on the history of the notion of time, that temporalises (itself). This might be taken to mean that temporality and time have now acquired a different origin from Dasein, and are perhaps derived from the other side of the line between beings and Being, that is, from Being. But this line is not crossed here, even though it is alluded to often enough. On the contrary, Heidegger keeps writing about the anchoring of the primordial temporality in the authentic Dasein.⁵³

Do things change when we try to take into account the second,

⁵¹ On the basis of Heidegger's discussion of Dasein and Temporality in the second Division of *Sein und Zeit*, Piotr Hoffman has argued that Heidegger remained imprisoned in the subjectivist tradition of Western philosophy that he rejected. See his article 'Death, time, history: Division II of Being and Time', in *The Cambridge Companion to Heidegger*, op. cit., pp. 195–214; cf. also Philipse, *Heidegger's Philosophy of Being*, pp. 23–25.

⁵² *Sein und Zeit*, p. 191 and in many other passages.

⁵³ Dostal, referring to *Sein und Zeit*, pp. 331–333, believes that, according to Heidegger, the primordial time has priority over Dasein. See *The Cambridge Companion to Heidegger*, op. cit., pp. 149 and 168 n. 18. However, when Heidegger speaks of 'the demonstration of the possibility of Dasein's state of Being on the basis of temporality' (p. 331), there is no need for this to refer to an *ontological* priority of that temporality.

uncompleted half of *Sein und Zeit*? Its first part, i.e. the third Division of Part I, was entitled ‘Time and Being’, and would thus have dealt with time in relation to being in its full generality, the being of all beings. In the introduction, Heidegger had already referred, in connection with the question of the meaning of being, to the preponderant importance of time for ontology, namely when he assumes the task of showing ‘that the central range of problems of all ontology is rooted in the phenomenon of time [. . .]’.⁵⁴ And the completed half ends with the questions: ‘Is there a way leading from primordial *time* to the meaning of *being*? Does *time* itself reveal itself as the horizon of *being*?’⁵⁵ Here and there in his other writings there is something to be found on this, especially in the 1927 lectures on the basic problems of phenomenology, that are said to be an elaboration of the third Division of Part I of *Sein und Zeit*,⁵⁶ but the harvest is meagre. After a few introductory remarks on the history of ontology, the course provides an extensive treatment of the ‘regional’ ontologies of nature and mind, followed by a useful clarification of primordial temporality and vulgar time. Heidegger then goes on to introduce the term *Temporalität* alongside *Zeitlichkeit*. The former refers to *Zeitlichkeit* as a condition for understanding being.⁵⁷ It thus establishes a connection with Being in the general sense, but still refers to Dasein. So although it may be the case that being can only be understood from *Zeitlichkeit*, in that capacity (i.e., as *Temporalität*) it still belongs to Dasein. A little earlier Heidegger had even said so in so many words by recalling that ‘all time belongs essentially to Dasein’.⁵⁸ The terminological finesse thus does not yield very much, and once again there is no reason to depart from the earlier conclusion that there would be no time without Dasein, and thus without consciousness too.⁵⁹ Everything indicates that in the complete work Heidegger would have radically settled accounts with the time

⁵⁴ *Sein und Zeit*, p. 18.

⁵⁵ *Ibid.*, p. 437; cf. also the end of section 66, p. 333.

⁵⁶ *Kant und das Problem der Metaphysik*, which was published in 1929, is also connected with an unwritten section of *Sein und Zeit*, namely the first Division of part II.

⁵⁷ *Die Grundprobleme der Phänomenologie*, pp. 388ff. See the commentary in connection with the unwritten third division in Karin de Boer, *Thinking in the Light of Time*, chap. 3.

⁵⁸ *Ibid.*, p. 370.

⁵⁹ For a thorough and extensive discussion of this question, see Blattner, *Heidegger's Temporal Idealism*, esp. ch. 5.

of beings that have no Dasein character and that, in his perspective, constitute nature, for the remark that 'all time belongs essentially to Dasein' served precisely to counter the thesis that a natural time can exist: 'There is no natural time in so far as all time belongs essentially to Dasein'.⁶⁰

Bergson, Husserl, Heidegger—in spite of the contradictions between them and the different methods that they may have applied, all three end up with a primordial time that is closely connected with consciousness and that is regarded as the source or foundation of all time. Bergson found duration through intuitive introspection; Husserl found the absolute flow of consciousness through reduction; and Heidegger found temporality through his analysis and interpretation of Dasein. But in a completely different way from Bergson, and differently from Husserl as well, in Heidegger this primordial temporality has nothing to do with progression or succession. The so-called ecstasies of future, present and past exist together and simultaneously for him. They may be the basis of all diachronic relations, but they themselves do not display any succession.

How is that possible? How is the simultaneous dialectic of the three ecstasies translated into a form of diachrony? It is a difficult question (the second Division of *Sein und Zeit* is even more opaque than the first), but it seems clear that the decisive link between the two levels is formed by what Heidegger says about project as a characteristic of Dasein. That project (*Entwurf*), a part of understanding (*Verstehen*) the situation in which one finds oneself, has a foundation, a goal, an 'upon-which' (*Woraufhin*), in which the individual existence can realise its identity (*Selbstheit*) and actualise itself as what it is.⁶¹ Once again it is primarily the future that is at issue here, although this time in the more or less ordinary, vulgar meaning of the word; and once again, the past and the present are involved in this future, precisely as for primordial temporality. For to become what one is is also to be what one has been. All three play a part in this wholeness (*Ganzheit*), even though they have now acquired their unambiguous temporal meaning. This practical temporality, Heidegger claims, can only be understood properly in the light of the ultimate

⁶⁰ Cf. R.J. Dostal, 'Time and phenomenology in Husserl and Heidegger', in *The Cambridge Companion to Heidegger*, op. cit., esp. pp. 157–164. Dostal notes (p. 163) that in his lectures on the history of the notion of time, Heidegger had already called the movements of nature simply free of time.

⁶¹ *Sein und Zeit*, esp. pp. 316–325.

Gewesenheit of death, on the basis of which the concept of primordial temporality was developed. Finally, abstract, levelled time can be understood on the basis of practical or concrete time, just as abstract space can only be understood on the basis of the concrete space of being-in-the-world.⁶²

While for Heidegger the project (*Entwurf*) is the link between primordial temporality and vulgar time, for Sartre the *projet* is rather the core of primordial temporality itself. His *L'Être et le Néant* (1943) contains various borrowings from Heidegger, including a few key terms and also a penchant for eccentric words, new meanings and strange sentence constructions. The result, however, looks very different, and that goes for time too. This is above all because here it is not being-towards-death but being condemned to freedom that determines temporality.

Human freedom has, as is known, an extreme character for Sartre. Nothing can exempt us from this freedom, we are responsible for everything that we do or do not do; it is bad faith (*mauvaise foi*) to want to evade it. More in particular, we can never appeal to our past by way of excuse, justification or explanation. In the very first chapter of the book, in the section on the origin of nothingness, Sartre writes that we are radically divorced from our past. A conscious being has to define himself in relation to his past as something from which he is divorced by a void, a nothingness, that is: his freedom. For 'freedom is the human being putting his past out of play by secreting his own nothingness'. That does not alter the fact that the human being *is* his past, but he is so in the manner of 'nihilation' (*néantisation*): he is his past, in other words he cannot shake it off, but at the same time he is not it, in other words, he transcends it from moment to moment and cannot appeal to it as something that belongs to him. The same applies to the future.⁶³ A few pages further on Sartre illustrates the irrelevance of the past with the experience of the gambler who decided yesterday not to gamble any more but only experiences that decision today in the casino as a recollection, summed up as: 'I make myself *not to be* the past of good resolutions *which I am*'.⁶⁴

⁶² See above, p. 204. Cf. Philipse, op. cit., pp. 123 and 147–150.

⁶³ *Being and Nothingness*, pp. 27–28.

⁶⁴ *Ibid.*, p. 33.

It is thus understandable that in the structure of past, present and future, it is not the future, as it was for Heidegger, that is the primary dimension for Sartre, and certainly not the past either, but the present. After all, it is in the present that the decisive choice is made each time, and it is there that freedom is actualised. Sartre argues this in the chapter that is specially devoted to temporality ('La temporalité'). The present does not have ontological priority, it is true, because it is determined by the future and the past just as much as it determines both of them, but it does have a privileged position as the mould of non-being in the fullness of being.⁶⁵ In this way it is also connected in the most direct manner with consciousness; it is of the same order, and is in principle even identical to it, for Sartre describes consciousness too as being a void amid the fullness of things.

In the first part of this chapter on temporality, Sartre writes engagingly and paradoxically in separate sections about past, present and future. He argues that the past only came into the world through the 'for-itself' (*pour-soi*), as my own past only came into the world through myself. The 'in-itself' (*en-soi*) does not have such a past, for it is simply what it is; the for-itself, on the other hand, *has to be* what it is (and is not). It is not that this brings the content of the past into existence; that content *is*, as every in-itself is, but it only becomes a part of a world with coherence and meaning through the intervention of a for-itself that assumes the past *as* a past. For the things of the in-itself, all that the present entails is that they are there over against a for-itself. And once again the present of the for-itself seems to be the for-itself itself, though under a different name. As a flight from the past to the future it is not what it is (past) and is what it is not (future). The in-itself does not have such a future; it is pure actuality. Only the for-itself, more in particular a human being, has a future.

Without for-itself, thus without consciousness, the structure of present, past and future would not exist. But this applies not only to the phenomenological structure of the three ecstasies outlined above, but also to the ontological structure of succession described in the second part of the chapter on temporality, and it applies not only to the static structure of prior and posterior but also to the dynamic

⁶⁵ As such it is the necessary condition of the synthesis of temporality: *ibid.*, p. 142.

structure of change. For prior and posterior only exist thanks to a being that does not coincide with itself but stands outside itself, while change is naturally given with the for-itself and only forms a problem within the in-itself.⁶⁶ By virtue of its spontaneity and thereby its nihilative function, the for-itself is essentially temporal for Sartre. Just as there is no temporality without for-itself, there can be no for-itself without temporality. But the for-itself only becomes aware of that temporality in psychological temporality, which is the result of reflection on the primordial temporality.

As in Heidegger, for Sartre too the universal and objective world time only appears in the last instance. However, this time too still proceeds from the for-itself; it is as it were the extreme manifestation of the temporality of the for-itself. It includes the things, but does not belong to them; these things 'do not endure; they are. Time flows over them'.⁶⁷ The same is true of my past, but only of my past. My past has its place in the time of the world, but it is through present and future that I escape from it.

Heidegger and Sartre were both pathetic philosophers, each in his own way, whose pathos was vigorously manifest in their doctrine of time. For those who are tired of the opaque Heideggerian discourse and the proliferation of paradoxes in Sartre, the more sober work of Merleau-Ponty may come as a relief, even though he is not averse to some wordplay either and is generous with metaphor. Understandably, much more attention is devoted to space than to time in his *Phénoménologie de la perception* (first published in 1945). After all, space is more closely connected with corporeality, which Merleau-Ponty takes to play such a central role in our familiarity with the world. Time, however, is not forgotten, and there is a separate chapter on it called, as in Sartre, 'La temporalité'. Anyone who expects to find something about our corporeal temporality here, for example in connection with our biological rhythms, will come away disappointed. Instead, Merleau-Ponty here develops a synthesis of ideas

⁶⁶ 'Temporality exists only as the intra-structure of a being which has to be its own being; that is, as the intra-structure of a For-itself' (ibid., p. 136). One of Sartre's objections to Bergson is that the latter assumed a duration with components that succeed one another and penetrate one another in a quasi-musical way without assuming an organising act that brings about such a synthesis (ibid., p. 135; cf. pp. 166–167).

⁶⁷ Ibid., p. 205.

from Bergson, Husserl, Heidegger and Sartre. Besides all the explicit references, it is difficult to read this chapter without continually hearing the echoes of these four philosophers, albeit transposed into a different key and set in a new context. It is precisely that synthesis that is new and original here, for no matter how much his predecessors may have belonged to a single tradition, their notions of time were by no means identical. Those conceptions are adapted and bent to fit the framework that Merleau-Ponty has developed here.

Time is not a real process that only has to be registered by human beings for Merleau-Ponty either, for it arises from our contact, our relationship to things: 'It [time] arises from *my* relation to things'.⁶⁸ It is not that past and future are not found within things themselves—they are found there, but both too much and too little. They are present there for once and all as a part of a 'present' where everything is manifest, but precisely for that reason they lack the irreality that is so characteristic of them both in their true sense. 'The objective world is too much of a plenum for there to be time. Past and future withdraw of their own accord from being and move over into subjectivity in search, not of some real support, but, on the contrary, of a possibility of not-being which accords with their nature'.⁶⁹

In the objective world everything exists side by side and there is no succession or change. These require a subject: 'Time presupposes a view of time'.⁷⁰ Even what we interpret as a trace of the past does not in itself refer to the past; that only takes place because we already have a view of the past and dispose of this dimension. Strictly speaking, time is not a given of consciousness, as it is for Bergson. It is more precise to say 'that consciousness deploys or constitutes time. Through the ideal nature of time, it ceases to be imprisoned in the present'.⁷¹

But the chapter has an epilogue, in which Merleau-Ponty places

⁶⁸ Merleau-Ponty, *Phenomenology of Perception*, p. 478.

⁶⁹ *Ibid.*, pp. 478–479; or somewhat more from an active subjectivity: 'The past, therefore, is not past, nor the future future. It exists only when a subjectivity is there to disrupt the plenitude of being in itself, to adumbrate a perspective, and introduce non-being into it. A past and a future spring forth when I reach out towards them' (p. 489).

⁷⁰ *Ibid.*, p. 477.

⁷¹ *Ibid.*, p. 481.

his view of time within the wider context of his view of humanity and the world. Here it transpires that, in spite of the preceding, he turns his back on a purely idealist view of time. Even though the objective world may be timeless and immutable in itself, there is also the world-in-which-we-live, the world-to-which-we-belong, the Heideggerian world of being-in-the-world and the Husserlian *Lebenswelt*. This world is our shelter, we are it in a certain sense ourselves, and that is why the dilemma between idealism and realism collapses, or rather, why the two must be connected with one another. For the *Lebenswelt* is not the terrain where an autonomous, constitutive spirit holds sway by conferring meaning on indifferent material, but on the contrary it is the source of that conferral of meaning itself, ‘the native abode of all rationality’—and of the original temporality too, one must suppose.⁷²

In spite of the brilliance of this remarkable chapter, the synthesis is not without its tensions. Time is anchored in our consciousness but also in our world; it only arises through my relation to the things, but also appears in the things. The claim that the objective world in itself does not have succession or change, but that both of them arise from the subject, remains intact—at the price of the subject’s being presented in both a narrow and a very wide sense.

Besides the ideas of several predecessors, Merleau-Ponty also synthesises the fields of philosophical anthropology and ontology. Most philosophical anthropologists had abandoned this by now. In so far as they talked about time, they generally confined themselves to human temporality (or to the temporality of people and animals, or even of all living organisms, as in Helmuth Plessner’s *Die Stufen des Organischen und der Mensch* of 1929),⁷³ without raising the question of the foundation or mode of existence of time itself.

In so far as that does still happen within the movement under discussion here, the views of previous thinkers continue to be as important as they had been for Merleau-Ponty. That is very clear in Hans-Georg Gadamer’s reflections on the problem of time (which have been included in a separate section of his collected works).⁷⁴

⁷² Ibid., p. 500. For a more extensive argumentation of this connection between idealism and realism, Merleau-Ponty refers to his *La structure du comportement* (1942).

⁷³ See esp. ch. IV, sections 9 and 10.

⁷⁴ Gadamer, *Gesammelte Werke*, Vol. IV, Part II, ‘Das Rätsel der Zeit’.

In thorough discussions with predecessors, in which not only modern philosophers but also Plato, Aristotle, Plotinus and Augustine occupy a prominent place, he defines his own position with regard to the mode of existence of time. He does so in particular in an essay written on the occasion of Heidegger's eightieth birthday, 'Über leere und erfüllte Zeit' (1969). The core of this essay consists of the concept of 'transition' (*Übergang*). The elusive and empty succession of moments is only conquered, Gadamer argues, when past and future remain connected with one another in the form of farewell and commencement. In the transition thus conceived, the separateness of past and future is combined with continuity. Only then does genuine time arise: 'Transition appears as the true being of time, in so far as everything is simultaneous in it and past and future are united in it'.⁷⁵ Of course, such an experience could not exist without consciousness; but neither could the transition itself, since it is nothing outside this experience.

Emmanuel Levinas adopted a greater distance from his predecessors in the lectures on 'La mort et le temps' that he gave in the Sorbonne in 1975–1976, the text of which was published almost twenty years later, together with a second course ('Dieu et l'ontothéologie') in *Dieu, la mort et le temps*. He refers intensively to Heidegger here, but also to Bergson, Kant and Hegel. He even provides a systematic commentary on Heidegger's doctrine of time, but he does so not to concur with it, but to present his own view in sharper relief. Unlike Heidegger, Levinas does not take one's own death to be the primary starting point, but the death of the other. Death does not mark the definitive end for him either, but the unbounded ongoing responsibility of the survivor. And as far as one's own death is concerned, the most important thing is not its eventual certainty, but its provisional indeterminacy, for that indeterminacy offers a view of eternity. From Heidegger's perspective this seems to be a reprehensible diversion, a fall from authentic existence, but it is not so. For the essence of time itself, as Levinas repeatedly states, is our relation with eternity. No matter how different this may be from the doctrine of his direct predecessors, it does contain an echo of the *Timaeus*.

⁷⁵ Ibid., p. 149; cf. also pp. 149–153.

CHAPTER FIFTEEN

THE VIEW FROM PHYSICS: THE EMPIRICISTS

The founders of the modern empiricist philosophy of time were Ludwig Boltzmann, Ernst Mach, and Henri Poincaré. About a century ago they put forward ideas that were subsequently elaborated in breadth and depth by such successors as Hans Reichenbach, Adolf Grünbaum, Bas C. van Fraassen and Huw Price. It goes without saying that the profound changes in the theory of physics and in that science's view of the world that took place at the beginning of the twentieth century played an essential role in this process. Both the theory of relativity and quantum mechanics have left their mark on the empiricist view of time. The same is true of cosmology, with its ideas about the big bang and the expanding universe.

Of course, there was as yet little of this to be found in the work of Boltzmann, Mach, and Poincaré. Boltzmann's ideas were primarily concerned with the significance of thermodynamics, a discipline to which he had made a decisive contribution. He was one of the first to wonder whether the direction of time can be explained by the second law of thermodynamics, which states that the entropy (or chaos) of closed systems increases. The fundamental laws of physical movement are symmetrical in time; they remain valid if t is replaced by $-t$; all movements are thus possible in the opposite direction. The second law, on the other hand, is asymmetrical in time. Is the direction from past to future essentially one of increasing entropy? But he realised that this law has a statistical character and thus does not rule out the return of situations of lower entropy. What is more, as early as 1889 Poincaré proved that it is theoretically almost certain that in such a closed system, every prior situation with lower entropy returns approximately in the very, very long term. Boltzmann realised, moreover, that the probability of a high entropy applies equally to the past; and that raised the question of how the entropy can be so low in our environment today and may have been even lower in the past. Certainly, without such a low entropy there would be no life; our environment is bound to display a low entropy for that reason. But how is that possible? Although

he failed to come up with a conclusive answer to that question, he suggested that our understanding of past and future is based on the actual increase of entropy. At first sight that does not make time dependent on mind; indeed, the contrary is the case. Upon closer inspection, however, matters are different: after all, the mind is here required to experience and comprehend the direction of decreasing entropy as that of the past and the direction of increasing entropy as that of the future. Otherwise there are only differences in entropy.¹

Mach and Poincaré were fairly close to the theory of relativity. When Mach died in 1916, Einstein wrote in a memorial article that Mach's book *Die Mechanik in ihrer Entwicklung* (1883) displayed such an incisive insight into the weaknesses of classical mechanics that one might say that he here well-nigh posited the need for a general theory of relativity. Poincaré was a direct precursor of Einstein, and according to some experts he came close to discovering the special theory of relativity. In fact, however, Mach never accepted Einstein's theory of relativity. And when Poincaré reflected in 1912 on the significance of the latest developments in mechanics for the concept of space and time, he drew a rather conservative conclusion.

However that may be, it is natural to suppose that Einstein was inspired by Mach, one of the sharpest critics of the Newtonian notions of absolute space, absolute motion and absolute time. As far as time is concerned, Mach wrote that, although movements appear to depend on time, in fact they only depend on one another: 'It is utterly beyond our power to *measure* the changes of things by *time*. Quite the contrary, time is an abstraction, at which we arrive by means of the changes of things'.² An absolute time, independent of all change, is senseless in his view; we can neither measure anything by it nor measure it by anything else; it is 'an idle metaphysical conception'.³ Also our *idea* of time arises through the interdependence of things on one another. We choose as a measure of time one of the available movements that runs more or less parallel with this idea of time. 'If we have once made clear to ourselves that we are

¹ For an extremely clear exposition and discussion of Boltzmann's ideas on these matters, see Huw Price, *Time's Arrow and Archimedes' Point*, pp. 27–43.

² Mach, *The Science of Mechanics*, p. 273.

³ *Ibid.*, p. 273.

concerned only with the ascertainment of the *interdependence* of phenomena, [...] all metaphysical obscurities disappear'.⁴

Time is thus regarded here as a magnitude that is introduced to describe the interdependencies and in particular the quantitative relations between phenomena. Strictly speaking, it is no more than an instrument for such a description, an instrument that is itself constructed from specific constellations of phenomena. Time is merely a notion that makes this description simpler and more economical, though at the risk of its being taken to be an autonomous, independent entity. In its capacity as a constructed instrument, time is naturally the product of thought, and thus of the mind. It should not be forgotten, however, that this applies to time as a quantitative magnitude. The possibility that the phenomena take place in whatever way in time as a purely qualitative dimension remains. After all, as soon as one mentions movements, one is talking about a form of time.⁵

Mach also expressed his views on pre-scientific time as a part of his own ontology. He considered that in the last resort the whole of reality consists of elementary sensations (*Empfindungen*). This is true not only of the Ego and the individual consciousness, to which he did not attribute any overarching identity, but also of material objects and their properties, including the bodies of humans and animals. In the end, they are all clusters of sensations: 'Bodies do not produce sensations, but complexes of elements (complexes of sensations) make up bodies.'⁶ All these clusters differ from one another because they have different constituents. One object or body differs from another because it consists of other components; that is also how one mind differs from another, and how the mind differs from the body. Where the distinction is drawn between one object and another or between mind and external world, in other words, which sensations belong together in certain respects and relations and which do

⁴ *Ibid.*, pp. 275–276.

⁵ On the influence of Mach's ideas, including misunderstandings about them, in the work of Einstein and other physicists see Julian Barbour, 'The Development of Machian Themes in the Twentieth Century', in *The Arguments of Time*, ed. J. Butterfield, pp. 83–109.

⁶ Mach, *The Analysis of Sensations*, p. 29; see further the entire chapter 'Introductory Remarks: Anti-metaphysical'. Mach is here the founder of the neutral monism of the Neo-Realists and of what would later be called Phenomenalism.

not, is to a certain extent an arbitrary matter; in theory, the Ego could embrace the whole world.⁷ Irrespective of how instinctive all kinds of classifications and distinctions may be, in the end it is practical considerations that are the decisive factor here. With all that, mind and matter are not different because they are heterogeneous or consist of heterogeneous components, since they are composed of the same material. Some clusters and combinations of these combinations yield an object or a body, others a mind. The term ‘sensation’ may appear to be primarily concerned with psychological contents, but that is not the case here. To bring this out clearly, Mach often refers to ‘elements’, which is at any rate a neutral term. Of course, these elements are (capable of being) experienced.

Not only body and mind, but also space and time are nothing but combinations of such experiential elements. More in particular, all of our sensations, according to Mach, contain a temporal element, and long before natural science had developed, humanity had constructed time from these temporal elements, not so much in our mind (for that is not given independently of the elements either) as through the gradual separation and combination of certain types of sensation. Mach tried to describe aspects of this process on the basis of psychological and physiological considerations.⁸ His aim is to show how time, in all its forms, is a certain clustering of experiential elements, and one that is not driven merely by individual experiences but also by intersubjective factors and that is in principle capable of further development and refinement.

To what extent does this presuppose consciousness from the start?⁹ It has already been noted that it would be incorrect to state that time is constructed by the mind from the very first. It would even be misleading to say that the elementary sensations presuppose consciousness, for they are intended as the neutral elements from which both matter and mind are constructed. All the same, they are elements of *experience*, and that seems to imply a form of consciousness. At any rate, the processes of the construction, separation and

⁷ Ibid., p. 13.

⁸ See esp. *ibid.*, ch. 12, ‘The Sensation of Time’; in essence, these reflections go back to an article from 1865.

⁹ Although Mach often refers to historical developments, ‘from the start’ is used here not in a particular historical sense but in a systematic one.

combination of elements presuppose an agent that carries out all those processes. Without the operation of such an agent with its practical purposes, the world would be no more than an undifferentiated mass of elements; it is only by virtue of such an agent that objects, bodies and minds, as well as space and time, are produced. Certainly, that agent is not there from the start, since it is itself the product of separation and combination. It emerges as it were simultaneously with the rest, it develops simultaneously with everything that it brings about. All the same, time in its general, pre-scientific capacity would not be able to exist if consciousness and mind had not originated at the same time.

Poincaré's conclusions display a certain resemblance to those of Mach. Both thinkers assign a central role to such notions as convention, simplicity, economy and convenience. Moreover, for Poincaré, as for Mach, the analysis of time was analogous to that of space, though the latter was clearly more important in Poincaré's eyes. He devoted considerably more attention to the origin of our notion of space and, in connection with that, to the nature of geometry and the status of its axioms than he did to our notion of time and chronometry. He also did so earlier. From 1887 on, and in particular during the 1890s, he argued in a series of articles, some of which were collected in *La science et l'hypothèse* (1902), that the choice of a certain geometry as the basis for the scientific description of nature is conventional and is meant to provide the simplest possible description of nature. Euclidean geometry thus does not reflect the physical world more accurately than does non-Euclidean geometry. The question of its truth is pointless; it is like calling into question the truth of the metric system or the falsity of the older measures, or of one system of coordinates compared with another. What is at stake here is not truth but convenience: 'One geometry cannot be more true than another; it can only be *more convenient*'.¹⁰

¹⁰ Poincaré, *Science and Hypothesis*, p. 50; originally in *Revue générale des sciences pures et appliquées*, 1891, pp. 773–774. For more on Poincaré's view of space and geometry, see ch. 1 of my *La philosophie des mathématiques de Henri Poincaré*. The problem of time also played a role in Poincaré's discussion with Bertrand Russell in 1899–1900 in connection with Russell's *An Essay on the Foundations of Geometry*. On this see Grünbaum, *Philosophical Problems of Space and Time*, 2nd enlarged ed., pp. 44–48 and 548–550, and B.C. van Fraassen, *An Introduction to the Philosophy of Time and Space*, pp. 78–81 and 204–206.

It was only at a somewhat later stage that he turned to the analysis of the notion of time. In his article 'La mesure du temps', which was first published in 1898 and was included in the 1905 collection *La valeur de la science*, Poincaré argued that, although we directly know the chronological order or simultaneity of our conscious experiences, and in some cases can even predict without difficulty which of two future experiences will be prior to the other, we have no intuitive knowledge of the precise duration of our conscious processes, nor of the chronology or even synchrony of external events vis-à-vis our conscious experiences. Agreements have to be made, according to Poincaré, before we can say anything meaningful about that. Without such agreements, the duration of periods remains indefinite, and we cannot even say anything about the order of events that cannot be directly compared with one another in our consciousness. Admittedly, the succession of cause and effect plays an important role here, but in itself that does not solve the issue because we often distinguish cause and effect precisely on the basis of their succession in time. Chronometry, like geometry, is based on conventions, which cannot be evaluated in terms of their truth, but only in terms of their convenience. 'We therefore choose these rules, not because they are true, but because they are the most convenient, and we may recapitulate them as follows: "The simultaneity of two events, or the order of their succession, the equality of two durations, are to be so defined that the enunciation of the natural laws may be as simple as possible. In other words, all these rules, all these definitions are only the fruit of an unconscious opportunism".'¹¹

That opportunism may be unconscious, but all these rules and conventions are of course based, as is the construction of the notion of time in Mach's theory, on the activity of a thinking consciousness. Poincaré, however, does not raise the question of that consciousness itself. In his vision, every human consciousness is regulated by an intuitive, natural chronology and thus a basic, albeit purely qualitative notion of time. It is only when the step is taken towards a quantitative notion of time and the extrapolation to external events that conventions are called for. But this holds in a particularly radical form, for Poincaré stresses to what extent even the relations of simultaneity and succession immediately lose their naturalness once

¹¹ Poincaré, *The Value of Science*, p. 36. Cf. also pp. 28 and 30.

one steps outside the limit of the personal consciousness and considers external events (physical events and the experiences of other consciousnesses). A decisive factor in this is spatial distance, combined with the awareness that events that take place elsewhere cannot be immediately known to us, for the assumption of an infinite, omniscient consciousness, even as a theoretical construction, has nothing to offer.¹²

To sum up, then, Poincaré holds that there is a natural, restricted, qualitative time within consciousness, and a thoroughly artificial, partly quantitative time outside it that is always related to our perspective. Does this leave any room for time external to consciousness? It probably does. Poincaré only considers physical time in its scientifically advanced forms, and his argument does not have to rule out the possibility of succession in time independently of any consciousness. Local events could be held to be simultaneous or successive depending on whether a hypothetical observer on the spot took them to be simultaneous or successive. That would not require any conventions. But it only yields temporal succession in a very limited sense. There could be no question of a general, unrestricted simultaneity or succession for all the events in the universe. Although in this essay Poincaré only refers to Newton in connection with the laws named after him, it is clear that he does not believe in Newton's absolute time.

Much of what Poincaré says, especially in connection with the distance between observer and events, even seems to anticipate Einstein's special theory of relativity of 1905, the year in which *La valeur de la science* was published. That is not surprising, for at about the same time Poincaré published several academic articles that came close to this theory.¹³ A few years later, Poincaré would explicitly react to Einstein's findings in connection with his analyses of space and time.

He did so in an article that was published in his last year, 1912, in the journal *Scientia* and in the following year in *Dernières pensées*, entitled 'L'espace et le temps'. At the end he refers to the transform-

¹² Ibid., pp. 31–32. Cf. Barbour, *The End of Time*, pp. 123–124, 135–136 and ch. 5.

¹³ See especially 'Sur la dynamique de l'électron'. Apparently Einstein did not know this work by Poincaré, although he had read *La science et l'hypothèse* intensively. On the relation between Poincaré and Einstein see A. Pais, 'Subtle is the Lord', pp. 126–130 and 164–172.

ational equations of Lorentz and to Einstein's conclusion (though he does not mention him by name) that the observation of synchrony is dependent on the state of motion, and he remarks that space and time have together become a four-dimensional entity; or rather, everything takes place as though time were a fourth dimension of space.¹⁴ Above all, he notes that an important possibility for determining succession, namely the consideration of an event as the possible cause of another, has been considerably limited, for the postulate that the speed of light is the maximal speed means that in principle a good many events can no longer be regarded as the causes or effects of one another. Does this amount to a refutation of the conclusions that he had drawn earlier? Poincaré himself does not think so, because it was merely a matter of the conventions that were chosen, in the last resort, for convenience's sake, even though this was done on the basis of what experience had taught us. It is now possible, if one chooses, to convert the translation of rigid bodies into the translation of mechanical systems while maintaining the relevant differential equations; the old geometry is thus replaced by a joint spatio-temporal geometry. Poincaré does not take this difference to be important or fundamental.¹⁵ Many find the new convention an unsuitable solution and can retain the old one if they prefer. And he concludes by stating, *entre nous*, his belief that they will continue to do so for a long time to come.¹⁶

It is possible to take this as an ironical remark on the conservatism of many of his colleagues. That does not alter the fact that, regarding the choice of such conventions, Poincaré showed a lot of respect for the force of habit. When, several years earlier, he had described a physical world whose inhabitants would almost certainly use a non-Euclidean geometry, he had concluded that, if set in that world, we would remain true to Euclid. We would find it easier not to change our habits: '[. . .] as for us, in the presence of the same impressions, it is certain that we should find it more convenient not to change our habits'.¹⁷

¹⁴ Poincaré, *Dernières pensées*, p. 53.

¹⁵ *Ibid.*, pp. 50–52.

¹⁶ *Ibid.*, p. 54.

¹⁷ *Science and Hypothesis*, p. 71. See also p. 73. For critical commentary on this, see Ernest Nagel, *The structure of science*, pp. 260–265.

After the foundations of the modern empiricist philosophy of time had been laid in the work of Boltzmann, Mach and Poincaré, a spectacular development was to follow. From the 1920s on this branch of philosophical analysis flourished, above all when practised in connection with the philosophy of space. The theory of relativity came to play a major role with its implications for the notions of simultaneity, succession and duration.¹⁸ Of crucial importance was Minkowski's diagram of the absolute past and the absolute future of a determinate here-and-now, both bounded by the light cone. A later variant was the four-dimensional representation of the world, in which each object has its own so-called world line, consisting of all the points (x, y, z, t) that the object occupies during its existence. This four-dimensional manifold was assigned the name 'block universe'. Its temporal dimension, block time, was the objective counterpart of the ongoing and passing time that people experience internally. Hermann Weyl wrote that the objective world does not 'happen', that is, does not consist of successive events, but in its full scope simply *is*; only when contemplated by my consciousness, that moves along the world line of my body, does it unfold in a constantly changing panorama.¹⁹

Various prominent physicists took part in the debate, including Weyl and Arthur Eddington,²⁰ while other contributions came from professional philosophers such as Russell, Whitehead, Emile Meyerson,²¹

¹⁸ The so-called twins paradox was particularly spectacular: if one of them went on a top-speed voyage through space, upon his return to earth he would be younger than the twin who had stayed at home; but given the relativity of movement, the latter would also be younger than the space-traveller. The problem has been resolved as only a pseudo-paradox. Cf. for example Dennis Sciama, 'Time "Paradoxes" in Relativity' in Flood and Lockwood (eds), *The Nature of Time*, pp. 6–21, and Paul Davies, *About Time*, pp. 59–65.

¹⁹ Weyl, *Philosophy of Mathematics and Natural Science*, p. 116. An interesting precursor is H.G. Wells, whose *Time Traveller* states that the difference between the temporal dimension and the three spatial dimensions is often exaggerated: 'There is no difference between Time and any of the three dimensions of Space except that our consciousness moves along it' (*The Time Machine*, 1895, p. 4). On the following page he describes man as a 'Four-Dimensional being, which is a fixed and unalterable thing'.

²⁰ Esp. in *Space, Time and Gravitation* and *The Nature of the Physical World*. For a later period Henry Margenau should be mentioned with his book *The Nature of Physical Reality* (ch. 7: 'Space and Time').

²¹ For Meyerson see esp. his *Identité et Réalité*. Adopting a wide historical perspective, Meyerson shows to what extent physics has tried to eliminate time as a dimension of change.

Moritz Schlick,²² Rudolf Carnap, and in particular Hans Reichenbach. The latter devoted himself to the problems of time and space from 1920 down to his death in 1953 and published a number of influential but also controversial books on the subject: *Axiomatik der relativistischen Raum-Zeitlehre* (1924), *Philosophie der Raum-Zeitlehre* (1928), and the posthumous *The Direction of Time* (1956). A concise summary is offered in the chapter 'What is Time?' in *The Rise of Scientific Philosophy* (1951).

Like his predecessors, Reichenbach emphasised that chronometry implies conventions. As in the case of space, decisions have to be made on the precise measure and method of measuring time. This is not a question of discovering something that is hidden in the real world. Rather, decisions have to be made on the basis of discoveries. These decisions are contained in what Reichenbach called *Zuordnungsdefinitionen* (coordinative definitions): definitions in which concepts are linked with real things. They contribute to determining the final system, but, like the definitions that link concepts to other concepts, they are in principle arbitrary.²³ Reichenbach's coordinative definitions correspond to what were later, following P.W. Bridgman, to be called 'operational definitions'. As far as space is concerned, Reichenbach differed from Poincaré in stressing the conventional nature of the definitions and not that of geometry. He did call the latter 'relative', that is, dependent on the basic definitions, but he went on to argue that physical geometry can be empirically established by virtue of those definitions, at least provided the methodological agreement is made not to appeal to universal forces.²⁴

Agreements are also required for the determination of simultaneity, certainly for the case in which the events concerned are far removed from one another in space. Poincaré had already made the point in 1898, and the question was raised more acutely in Einstein's special theory of relativity because the speed of light in a vacuum had here been postulated as the maximal signal speed. Another insight was added to this that was also derived from Einstein: observers who move in relation to one another regard different groups of events

²² See esp. Schlick's posthumous work *Grundzüge der Naturphilosophie*, with a concise and clear commentary on the block universe in ch. 7.

²³ Reichenbach, *The Philosophy of Space and Time*, section 4.

²⁴ He was here elaborating on the work of Riemann and Helmholtz as well as on that of Mach and Poincaré.

as simultaneous. Reichenbach went in detail into the vain efforts to escape from the relativity of simultaneity.²⁵

All in all, the mind thus plays a key role here in the measurement of time. Nature in itself is metrically amorphous; the most that one can say is that it allows different metrics. Temporal succession and the direction of time, on the other hand, are anchored in nature, according to Reichenbach, because he takes them to be embedded in natural causality. In that case, no further contribution of the mind is required for their existence and determinacy. They are not essentially dependent on conventions or other intellectual activity. 'Time order reflects the causal order of the universe', is his succinct formulation.²⁶ Still, the rejection of absolute time had also created some complications here because of the conventional character of simultaneity discussed above. On the rebound this was in danger of conventionalising temporal succession to some extent too, since (with a change in simultaneity) an event that precedes another event for one observer can be subsequent to it for another.

These anomalies, however, never come into conflict with causal relations, and Reichenbach was therefore able to continue to defend the thesis that succession and direction are determined by cause and effect. The premise (as in Leibniz) is then that A may be called prior to B and B posterior to A when A is the cause or a partial cause of B; events between which a causal relation is ruled out because a signal from one to the other arrives too late are finally all taken to be simultaneous.²⁷ This too is a coordinative definition, but here nature itself is the decisive factor. That is only possible, however, when the distinction of cause and effect can be made irrespective of the temporal sequence. Poincaré had already pointed out that this is often not the case, but Reichenbach considered that he had found a way of solving the problem. This is the variation or mark method: if two situations are causally connected, small variations in the cause are accompanied by small variations in the effect, but small varia-

²⁵ Op. cit., sections 19 and 20.

²⁶ *The Rise of Scientific Philosophy*, p. 150; Cf. *The Philosophy of Space and Time*, sections 21 and 43.

²⁷ *The Philosophy of Space and Time*, sections 21 and 22. This means that simultaneity is no longer a transitive relation; see Zwart, *Het mysterie tijd*, pp. 141–142. See also Zwart's critique of the causal theory for the relations prior and posterior (pp. 71–74).

tions in the effect are not accompanied by variations in the cause. This means that it would always be possible to distinguish cause from effect. However, critics were not slow to point out that this method only works in the case of marks which are known to be irreversible. Ergo it is not independent of time.²⁸

The direction of the causal chains is now, according to Reichenbach, also the direction in which time *moves*. Not only does it yield an asymmetrical ordering in terms of earlier and later that is strictly equivalent to the reverse ordering, but it also determines the direction or flow of time. We perceive this flow of time in ourselves, but it also prevails in physical reality.²⁹ There is a lot at stake for Reichenbach in linking the experience of time in consciousness with the flow of time in nature, because he was not prepared to attribute an independent significance, let alone priority, to the psychological experience of time.³⁰ He did believe, however, that the flow of time can only be found in physical nature if that nature is not completely determined. It is *indeterminism*, according to him, that allows a genuine transition from the (given) past to the (indeterminate) future via the present, for a complete determinism would put an end to the difference between past and future because it would pin down *both of them* completely. It would even do away with the present as the boundary between past and future. Such a deterministic worldview, Reichenbach believed, is hardly acceptable because the entire organisation of our lives is based on that distinction between past and future. Indeterminism, on the other hand, respects the present as the transition from past to future and assigns it a place in the physical worldview. He first defended this position in an article of 1925, 'Die Kausalstruktur der Welt und der Unterschied von Vergangenheit und Zukunft'. Later on he was to make use of quantum mechanics in this connection.³¹

²⁸ Henry Mehlberg, 'Essai sur la théorie causale du temps', *Studia Philosophica* 1 (1935), esp. pp. 215–216. Cf. Grünbaum, *Philosophical Problems of Space and Time*, pp. 179–188, and Van Fraassen, *An Introduction to the Philosophy of Time and Space*, pp. 172–175.

²⁹ 'When we speak about the progress of time, in contrast [i.e. in contrast to the empty progress of an asymmetrical ordering only] we intend to make a synthetic assertion which refers both to an immediate experience and to physical reality' (*The Philosophy of Space and Time*, section 21, pp. 138–139). Cf. section 43, 'The Singular Nature of Time'.

³⁰ *Ibid.*, section 16, esp. pp. 134–135.

³¹ To determine the direction of time, he also appealed (via the analysis of

Reichenbach's view of the significance of indeterminism soon ran up against opposition too, particularly from Hugo Bergmann in his book *Der Kampf um das Kausalgesetz in der jüngsten Physik* of 1929. Reichenbach's claim that determinism eliminates the distinction between past and future, and the present along with them, applies, according to Bergmann, to the general worldview of physics, whether determinist or not, for physics has no place for the Ego, while it is the experiencing Ego on whom the present, and with it the distinction between past and future, depends.³² Most convincing is perhaps the later criticism by the prominent continuator of Reichenbach's work on time and space, Adolf Grünbaum. Commencing around 1950, he raised the question of these two key concepts in a number of studies, paying explicit attention, more than his predecessor had done, to the role of mind and consciousness in bringing about time.³³

The main points can be found in Grünbaum's *Philosophical Problems of Space and Time* (1963; an expanded second edition was published in 1973). It contains critical discussions of predecessors, thorough analyses of the current state of the art, and developments of his own position. In this way the measurement of time and space, the related conventionalism, the general problem of the falsifiability of hypotheses, the causal theory of the direction of time and the philosophical aspects of the theory of relativity are all dealt with extensively. Chapter 8 is concerned with the anisotropy of time, i.e. the fact that the two directions of time are structurally different because some processes proceed in one direction but not in the other, even though that is only de facto and not nomologically so; the fundamental laws of physics, after all, are symmetrical in time and thus in principle admit the opposite direction too. Indeed, there are many such processes; examples are the almost proverbial broken teacup, a shower of rain, the collapse of houses in an earthquake, and the movement of water

separate, temporarily closed systems, so-called branch systems) to thermodynamic processes, especially in *The Direction of Time*. On this see Grünbaum, op. cit., pp. 254–264 and 278–280, with the corresponding appendices; and Huw Price, op. cit., pp. 44–46. There is a brief sketch of Reichenbach's position in the articles on him in *The Encyclopedia of Philosophy* and in *Routledge Encyclopedia of Philosophy*.

³² Bergmann, *Der Kampf um das Kausalgesetz*, pp. 27–28. Cf. Grünbaum, op. cit., pp. 322–323.

³³ His follower Bas van Fraassen did the same more briefly in *An Introduction to the Philosophy of Time and Space*, ch. III, section 4.

in waves after a stone is cast into it.³⁴ If their temporal orientation is chosen as the direction from lower to higher temporal values, from early to late, then this choice has a basis in physical reality and is thus not just conventional.

That is not to say, however, that time has one and only one direction! Grünbaum distinguishes temporal anisotropy sharply from the idea that time *flows* or *moves* in a certain direction. The anisotropy, that is, the structural difference between the two directions of time, is a property of physical time (that Eddington was the first to call time's arrow). The existence of the single direction is more and thus something different. That time flows in a single direction, that the future constantly becomes first present and then past, that there is a now that shifts (what Grünbaum elsewhere called the 'forward shifting now')—all this lies outside physics and belongs exclusively, according to Grünbaum, to the personal world of our experiences 'because the "now" with respect to which the distinction between the past and the future acquires meaning depends crucially on the egocentric perspectives of a conscious organism for its very existence'.³⁵ This conclusion is justified in more detail in chapter 10, 'Is there a "Flow" of Time or Temporal "Becoming"?'.

Grünbaum argues mainly in a negative way by criticising the attempts of others to confer physical reality on the present. Reichenbach played a major role in that with his claim that not determinism but indeterminism guarantees this reality. Grünbaum argues, however, that indeterminism in no way brings the present and the flow of time into the worldview of physics. No doubt there is a difference, physically speaking, between one moment of time and the other. Magnitudes can have different values at different moments. But whether or not the later values are determined in advance, the shifting now does not occur in physics: '[. . .] the issue of determinism *vs.* indeterminism is totally irrelevant to whether becoming is a significant attribute of the time of physical nature independently of

³⁴ Grünbaum also discusses here in detail the articles on the problem of the direction of time that Popper had published in *Nature* in the years 1956–1958. Popper had there argued (above all on the basis of the latter example) that the anisotropy of physical time is based on non-entropic, non-statistical phenomena. See *Philosophical Problems*, pp. 260–261 and 264–277.

³⁵ *Ibid.*, p. 218; for the expression 'forward shifting now' see p. 326 n. 7; Grünbaum also commits himself to the metaphor 'forward flow', p. 329.

human consciousness'.³⁶ Eddington, H. Bondi and G.J. Whitrow, on the other hand, shared Reichenbach's point of view, so their vision is combatted equally vigorously by Grünbaum. And with the disappearance of this alternative, Grünbaum retains his own claim that 'the flux depends for its very *existence* on the perspectival role of consciousness, since the coming *into* being (or becoming) of an event is no more than the entry of its effect(s) into the immediate awareness of a sentient organism (man)'.³⁷ So the answer to the question of whether there is a 'flow' of time or temporal 'becoming' is: yes, but only within the perspective of consciousness.

Grünbaum is an even more vigorous opponent of those, including Max Black and M. Capek in particular, who had deduced from the premise of the world as a four-dimensional, spatio-temporal manifold within which each object has its so-called world line, that this world is static and unchanging. Their argument was that the world lines are laid down once and for all in a (quasi-)spatial manner, and that, since change simply exists, on this point physics had degenerated, according to Black, into an unacceptable *metaphysics*. Grünbaum considers that this claim is based on a misunderstanding. He argues that change takes place within the block universe as well because (as noted above) magnitudes can have different values along the temporal dimension and two world lines may intersect at a single point, for example, while diverging in other respects. Changes thus certainly are represented in this spatial conception. More or less implicitly, however, Grünbaum does recognise that this refers to change in an elementary sense, for in passing he refers to 'mere change'. The fatal confusion, according to him, arises when 'mere change' is identified with 'becoming', as it had been by Black. Becoming requires more than physics can offer, namely the awareness that something is taking place, as Hermann Weyl had already realised and eloquently described before Hugo Bergmann. Both are cited as supporting Grünbaum's arguments in this polemical chapter.

Grünbaum's view differs somewhat from the conclusions drawn by Henryk Mehlberg in his lucid survey 'Physical laws and time's arrow'.³⁸ This is first of all because Mehlberg concluded on the basis

³⁶ *Ibid.*, p. 321 (emphasis removed).

³⁷ *Ibid.*, pp. 325–326.

³⁸ Feigl and Maxwell (eds), *Current Issues in the Philosophy of Science*, pp. 105–138,

of the nomological isotropy of time that the time of physics is isotropic; unlike Grünbaum, he saw no reason to assume an actual anisotropy.³⁹ More important, however, are the subtle differences in the evaluation of the egocentric perspective. Mehlberg believed that the assumption of an omnipresent isotropy of time obliges one to conclude that temporal terms such as 'past' and 'future' have no meaning in themselves, but only take on meaning from the context in which they are used. 'What I remember belongs to my past, by definition, and what I desire or am planning for, belongs to my future, by definition equally. But this need not prevent somebody else from desiring what I remember and, thus, from having his future overlapping with my past. To put a long story short: these vital temporal words, like 'future', 'past', 'before', 'after', etc., are 'egocentric particulars' exactly like the spatial adverbs 'here', 'there', 'underneath', etc.'⁴⁰ Grünbaum also appealed to the egocentric perspective, but to explain the flow of time and not to account for 'before' and 'after', and certainly not by analogy with the indexical spatial adverbs. On the contrary, for Grünbaum there is a strong contrast between time and space because of the flow of time. While Mehlberg's view is not so far from the notion that the egocentric experience of time is actually an illusion, Grünbaum emphasises its reality: although the flow of time only exists from the perspective of a consciousness, it is precisely for that reason that it does exist. In fact, in one of the passages cited Grünbaum had even italicised the word 'existence'.

Grünbaum returned to the question in a couple of later articles, most systematically in 'The Meaning of Time', his contribution to a *Festschrift* for Carl Hempel.⁴¹ Grünbaum here carefully contrasts his view of the dependence of the Now and of becoming on mind with the views put forward by others. Once again he demonstrates

with a vigorous polemic against Reichenbach, as in his treatise from a quarter of a century before.

³⁹ For Grünbaum's reaction to this, see *Philosophical Problems*, pp. 258–261 and 271–275.

⁴⁰ *Current Issues*, p. 137; the egocentric perspective is not strictly individual, by the way, since Mehlberg includes the linguistic community among the conditions of use. The term 'egocentric particulars' had already been used by Russell.

⁴¹ Nicholas Rescher (ed.), *Essays in Honor of Carl G. Hempel*, pp. 147–177; an earlier version of this article appeared as chapter 1 of *Modern Science and Zeno's Paradoxes*; a slightly later version can be found in Freeman and Sellars (eds), *Basic Issues in the Philosophy of Time*, pp. 195–228.

that the anisotropy of physical time does not imply that events pass from the future into the present and subsequently into the past. Even though physical time has a preferred direction, that does not give it movement. There is a succession of prior and posterior in the natural world, events take place at a certain point in time (measured by the clock of some world line or other), there is thus change, and any point in time can even in a certain sense be labelled as ‘present’—but the present as the locus of the flow of time or of events does not occur in physics. That requires consciousness, more in particular the awareness of experience: ‘what qualifies a physical event at a time t as belonging to the present or as now is *not* some physical attribute of the event or some relation it sustains to other purely physical events. Instead what is necessary so to qualify the event is that at the time t at least one human or other mind-possessing organism M is conceptually aware of experiencing the event at that time.’⁴² The present resides in the conscious experience of such an event, in the knowledge of having this experience, even though the event itself may have taken place earlier; of course, the possibility of this shift disappears in the case of mental events. Past and future are implied by this Now. Grünbaum further points out with some emphasis that the ‘nowness’ defined in this way is only possible thanks to a sufficient degree of determinism; only then is a correlation between physical events and the experience of them guaranteed.⁴³ Indeterminism is of no use, and certainly not for the origin of the physical flow of time, for that does not exist anyway.⁴⁴

This article also contains polemical passages, but its predominant character is that of treading warily: it painstakingly demarcates the author’s conception vis-à-vis alternative interpretations of time’s arrow, the block universe and (in)determinism. Within the camp of the

⁴² *Essays in Honor of Carl G. Hempel*, p. 155; with a further refinement in *Basic Issues*, pp. 206–207 (some italics have been dropped). Einstein was probably in fundamental agreement with Grünbaum. At the end of his life he told Carnap that he continued to be interested in the Now and that it was of crucial importance, but that it lay ‘just outside of the realm of science’: quoted by Carnap in Schilpp (ed.), *The Philosophy of Rudolf Carnap*, pp. 37–38.

⁴³ *Essays in Honor of Carl G. Hempel*, pp. 165–166; *Basic Issues*, p. 219.

⁴⁴ *Essays in Honor of Carl G. Hempel*, pp. 166–172; *Basic Issues*, pp. 220–227. Here once again there is criticism of the view of Reichenbach, Eddington, Bondi, Capek and Whitrow that determinism precisely would be fatal for the physical flow of time.

empiricists, Grünbaum steers a middle course between the physical maximalists (those who want to give the present and the flow of time a place within the worldview of physics too) and the physical minimalists (those who attribute a static worldview to modern physics, where the passage of time has a spatial character and there is no longer any question of change). He systematically avoids using the word 'illusion' in connection with the present which is dependent on the mind and cannot be found in physics. So again his course is a middle one, this time between the Now as a physical given (maximalism) and the Now as pure illusion (minimalism). Although Grünbaum has no doubt that the operation of the mind is based on the properties of matter, in this case the matter of the brain, he has no inclination to evaluate its products purely on the basis of our knowledge of matter (physics). He accepts what we all constantly experience (the Now, the flow of time) as a reality based on consciousness. Mehlberg's position was somewhat different, while a radically different point of view was adopted by the most fervent defender of the thesis that the experience of the Now and of the flow of time is illusory, J.J.C. Smart.

In a series of books and articles, Smart raised the question of the relation between science and philosophy. In doing so, he often took up the most extreme position, with regard to both the interpretation of physics and its importance for philosophy. For the problem of time, this meant that he defended a far-reaching analogy between the temporal dimension and the spatial dimensions, conceived of the block universe as a static entity in which no change occurs, regarded the experience of the flow of time, events or consciousness as an illusion, and placed himself in the Parmenidean tradition. These views are defended in his books *Philosophy and Scientific Realism* (especially chapter 7), *Between Science and Philosophy* (especially chapters 7 and 8), and in the article 'Time and Becoming'.⁴⁵

In the latter article he drew up the balance. In reaction to all those who take the flow of time and the 'becoming' of things embodied in it to be real, such as A.N. Prior, C.D. Broad and Richard

⁴⁵ In Peter van Inwagen (ed.), *Time and Cause*, pp. 3–15. Smart's own views are also conspicuously present in his article 'Time' in *The Encyclopedia of Philosophy*, vol. 8, pp. 126–134. For a critical discussion of the views of both Smart and Grünbaum, see Zwart, *Het mysterie tijd*, pp. 15, 36–39 and 148–156.

Taylor, he once again defended his view that this must be based on a misunderstanding.⁴⁶ The whole of reality, after all, is described by statements about what takes place at what point in time (and thus earlier or later), always of course related to a certain clock. These statements are immutably true. They are just as tenseless as statements about spatial relations: past, present and future do not play any part in them; before and after are related to one another like left and right. And he once again posits that the idea of the flow of time is the wrong kind of spatialisation of time and inevitably leads to the question of how fast that flow moves, a question to which only senseless answers can be given.⁴⁷

Smart has no clear-cut opinion on the source of the illusion of the flow of time. He discusses various possibilities, including an explanation that he had previously suggested himself, and suspects now that the illusion is based on a confusion between information flow and time flow: ‘that we are aware of the flow of information through our short-term memories and we confuse this with a flow of time itself’, although he recognises that he absolutely fails to understand how this confusion can happen.⁴⁸

But no matter how unclear the source of the illusionary experience of the present and the corresponding flow of time may be, this experience is an evident example of dependence on mind. Just as there can be no optical illusion without the capacity to see, so can there be no ‘mental illusion’ without the mind. Of course, Smart says that there is no flow of time, even with the mind, simply because that flow does not *exist*. But the corresponding experience (the illusion) is based entirely on the mind, not so much because *every* experience presupposes a mind, but because the pseudo-objects of *this* experience are produced by the mind. They are artefacts of ourselves.

Within the empiricist camp only the previously mentioned physical maximalists hold that time exists entirely independently of con-

⁴⁶ Prior will be discussed in the following chapter. Broad assumed different points of view on time; on this see the article by C.W.K. Mundle, ‘Broad’s views about time’.

⁴⁷ *Time and Cause*, p. 4. Cf. Smart, ‘The River of Time’ and ‘Spatialising Time’. According to Grünbaum, it was precisely the *question* that was senseless because a quantitative measurement is here being demanded of a purely qualitative notion; see *Philosophical Problems*, p. 329. Smart offers a detailed discussion of a new attempt (by Storrs McCall) to demonstrate the objectivity of the flow of time.

⁴⁸ *Time and Cause*, pp. 13–14.

sciousness and mind. All in all, the empiricists who are so strongly orientated towards physics made a major contribution to the centuries-old tradition of the dependence of time on the mind and (thus) on consciousness. They did so by denying important components of time to nature, as that is studied and described by the physicists. Bertrand Russell had already formulated the crux of the debate in 1915 when he wrote: '[. . .] past, present, and future arise from time-relations of subject and object, while earlier and later arise from time-relations of object and object. In a world in which there was no experience there would be no past, present, or future, but there might well be earlier and later'.⁴⁹

⁴⁹ Russell, "On the Experience of Time", p. 212. This article was originally intended as a chapter in a book on epistemology. That book was never completed. See *The Collected Papers of Bertrand Russell*, vol. 7, p. 64.

CHAPTER SIXTEEN

TOWARD THE PRESENT

The three previous chapters described the main developments from 1790 to around 1970. For clarity's sake they were divided into a limited number of tendencies. It is evident that the idea of the dependence of time on consciousness was widespread in the philosophy of this period. Not only in regular idealism (as one would expect), but also in the phenomenological and hermeneutic tradition, and even within empiricism, it was explicitly argued that time is dependent on consciousness in important respects.

It is true that this dependence was often only partial, as in the case of the empiricists. It is also true that the standpoint was sometimes somewhat ambiguous or unclear, as in the cases of Husserl and Cassirer. But that does not make the outcome any the less striking. Everywhere the essential role of consciousness in the full existence of time was pointed out. Of course there were dissident voices, as we have seen in the previous chapters, but these attempts to turn the tide met with little success.

The question remains of the developments in the philosophy of time in the last decades of the twentieth century. What is the state of affairs around the year 2000? It will first be necessary to consider the later vicissitudes of the traditions that have already been discussed.

In a certain sense Nicholas Rescher has weighed up the regular idealist position. His 1973 book *Conceptual Idealism* offered a systematic analysis of the dependence of our view of the world on the mind. He defended the thesis that essential aspects of things as we know and conceive them can only be understood if we take mental capacities into account. That means less than that all these things are products of the mind (ontological idealism), but more than that knowledge in itself requires mind (epistemological idealism).¹ His point of departure is the role of unreal possibilities. Unlike Kant, he regards

¹ Rescher, *Conceptual Idealism*, pp. 24–26.

the mind not primarily as the foundation of necessity, but as the foundation of possibility. It is thus not because laws of nature are necessary that their regularity can only be understood by appealing to mind, but because they are thought to apply equally in hypothetical (imaginary) circumstances. Besides this reference to unreal possibilities, procedures such as identification and ostension also depend, according to Rescher, on a contribution by the mind.

One of the chapters in his book is called 'The Mind-dependency of Time and Space', and it focuses on time. Rescher distinguishes between the ordering of distinct occasions in terms of prior and posterior ('bare temporality' or 'prototemporality'), on the one hand, and the measurability of time and the concept of the present, on the other. It is only when taken together that all these aspects lead to time in the full sense of the word ('full-blooded time' or 'time proper'). Temporal succession and the related changes are 'mind-involving', he claims, because the distinct occasions are based on identification, but in other respects they are not dependent on any contribution by the mind. On the other hand, however, mind does play an essential extra role in connection with the measurability of time and with the present, since measurability presupposes lawlike regularity and the present presupposes an ostensive activity of consciousness. It is only here that Rescher speaks of 'mind-dependency'. He even refers to a causal effect in that case. Although he had previously stated that the idealism he defends is not a causal or historical, but exclusively a conceptual theory, in the end he concludes that the mentalist character of the present 'makes nowness a causal product of the workings of conscious awareness'.²

Rescher's later work, *A System of Pragmatic Idealism*, resumes the problematic of *Conceptual Idealism* along with much else. After all, the purpose of this three-volume work is precisely to bring together all that he had set out in a series of previous books and to present it as belonging to a single conception. The subtitle of the first volume is *Human Knowledge in Idealistic Perspective*, and this is where the conceptual idealism that he had previously explicated is to be found, though now set in a wider context and equipped with a broader,

² Ibid., p. 131; cf. pp. 21–22 and 126. On pp. 127–131 Rescher goes in some detail into Grünbaum's argumentation concerning the dependence of the present on consciousness and the counterarguments adduced.

pragmatic motivation. It is presented as a middle course between extreme forms of idealism and realism, and is even accompanied by a defence of a realist position. This realism, however, is in turn founded on idealism: it holds, not that a physical object exists independently of the mind, but that our *conception* of a physical object is the conception of something that exists independently of the mind.³ Unfortunately, time as a separate theme has disappeared in this new version. It is still mentioned, however, for example in connection with the now prominent idealisation as a sign of mental activity: 'But insofar as, from the cognitive point of view, truth and universality are idealizations, so also is lawfulness, and with it such matters as space, time, element, and the other conceptual building blocks of our understanding of nature'.⁴ One may therefore assume that Rescher's earlier conclusions regarding the dependence of time on mind have remained intact. A new element is the argument that the dependence of important facets of our physical view of the world on the mind is compatible with a causal derivation of mind from matter.⁵

A certain rounding off of the idealist programme was sought in the same period, though in a very different direction, by Gilles Deleuze. Not that he presented himself as an idealist; he preferred to see himself as a successor to Nietzsche and Bergson in a tradition of marginal figures with connections in different directions, in his case also in the direction of empiricism. But that his philosophy of time is idealist at the core can be seen from the central position played in it by three transcendental syntheses. The first is that of the living and passing present, of which the past and the future are dimensions (as in Augustine). Because this synthesis already takes place in moving time, it presupposes a second synthesis, that of the pure past. The relation between these two syntheses is that of habit and memory, of foundation and ground, of soil and sky. Finally, they both function only by virtue of a third synthesis, that of the empty form of time. While time may seem to exist solely thanks to physical reality and its material processes and thus to be anchored in the *en-soi* (in-itself) of things, the third synthesis reveals this to be

³ Rescher, *A System of Pragmatic Idealism*, vol. 1, p. 274.

⁴ *Ibid.*, p. 213.

⁵ *Ibid.*, pp. 319–322.

an illusion; it exposes the *en-soi* as a correlate of representation. The *en-soi* of the past is revealed as a sort of optical, or rather erotic effect of memory itself. It also exposes the semblance of a simple circular movement, not to definitively replace it with a linear structure but to transform it into a more complex, paradoxical circular movement. For in the end time is the medium of constant renewal, in which the progressing present nevertheless repeats itself in a sort of eternal return: ‘The “once and for all” of the order is there only for the “every time” of the final esoteric circle’.⁶ In this synthesis, both the present and the past have become a dimension of the future.

According to Deleuze’s esoteric train of thought, these three syntheses are the foundation of the fourth synthesis, that of consciousness. He therefore did not assign the fundamental syntheses to that consciousness and not at all to the subjective or individual consciousness (a post-structuralist could not be expected to do that), but regarded them as a necessary matrix for temporal progress, for the paradoxical dialectic of actual and virtual. And so, all in all, one finds here, in spite of all kinds of explicit reservations, reminiscences of the idealism of Fichte and Hegel and of that of Kant and the Neo-Kantians, as well as evident traces of Bergson, Husserl, Heidegger and Sartre.⁷

Like Deleuze, Ricoeur also bears the traces of many philosophical traditions, particularly idealism, phenomenology and hermeneutics. His philosophy is of great importance for the continuation of all these traditions, and that is also true of his philosophy of time. This is contained above all in his famous work *Temps et Récit*, that was published in three volumes in the years 1983–1985 and subsequently appeared in English under the title *Time and Narrative*. As in each of his books, Ricoeur goes into the work of his predecessors at length; besides Aristotle and Augustine, Kant and Hegel play an important role here, as well as Husserl and Heidegger. Like Rescher and Deleuze, Ricoeur makes no attempt to join the efforts of the Marburg neo-Kantians to account for the developments within

⁶ Deleuze, *Difference and Repetition*, chap. 2, esp. pp. 76–77, 79–81, and 87–88. The citation is from p. 91.

⁷ Deleuze first presented his philosophy of time in *Différence et répétition* (1968), and later in connection with his theory of film in *Cinéma 2: L’Image-Temps* (1985). For a fuller presentation of Deleuze’s philosophy of time see Turetzky, *Time*, chap. 14, where other precursors of Deleuze are mentioned too, including the Stoics.

the exact sciences, though there is a certain affinity with Cassirer's philosophy of symbolic forms.

One of the threads running through the complex and at times labyrinthine *Time and Narrative* is the impossibility of connecting psychological time, that was first discussed thematically by Augustine, with physical or cosmic time, as it had been treated much earlier in Aristotle's *Physics*. Ricoeur not only argues this for Augustine, but he also provides extensive commentary on Husserl and Heidegger. His conclusion is that impasses are inevitable if one tries to account for physical time on the basis of a phenomenological analysis. This immediately explains the contradictions in which Husserl found himself caught when he tried to connect these two opposite poles.

Ricoeur's own approach to the question proceeds by way of several circumventions. He considers that a convincing explanation can only be obtained by relating both times to two intermediate areas, namely historiography and narrative literature. What these have in common is their narrative character, and it is above all on that aspect that their significance for the relation between the two irreconcilable poles is taken to be based. More in particular, in the case of historiography this mediating function proceeds by way of elements such as the calendar, the succession of generations and the traces of documents, while in the case of fiction it proceeds by way of manoeuvring fictional time and by the symbolic depiction of temporal attitudes. This does not solve the original problem, it is true, but it does make it transparent and harmless. The picture of time is rearranged, as it were, with the result that the original impasses vanish from sight. For according to Ricoeur, time only acquires its definitive significance and its true human meaning through the contribution of this double narrativity. In short, time requires narratives in order to manifest itself fully.⁸

⁸ Opinions differ on the purport and value of Ricoeur's analysis. There have been both extremely positive assessments and negative reactions. For some sceptical comments, particularly in connection with fictional narrativity, see Gregory Currie, 'Can there be a literary philosophy of time?' in Butterfield (ed.), *The Arguments of Time*, pp. 43–63, esp. 48–53. Currie also deals with the relation of Ricoeur's programme to that of Bakhtin: pp. 58–60. A certain development of Ricoeur's ideas is offered by the article of Jerome S. Bruner, 'Vergangenheit und Gegenwart als narrative Konstruktionen' in Jürgen Straub (ed.), *Erzählung, Identität und historisches Bewusstsein*, pp. 46–80.

Narrativity depends on consciousness, since it can only exist for a conscious mind. Ricoeur's standpoint is thus in principle an idealist one. It aims to focus attention on a hitherto neglected mental component of time. Moreover, it does not seem far-fetched to regard Ricoeur's narrativity as displaying an affinity with Cassirer's symbolic forms, even though he does not stress this connection. After all, this narrativity is just as much a wide-ranging means of knowing, describing and understanding the world.

Time, however, is not completely comprehensible for Ricoeur. He repeatedly states that, at least in its unity and completeness, time is invisible and unimaginable. Right at the end of the third volume he even emphasises the mystery of time; he then welcomes the fact that we are thereby reminded that the constituting subject cannot decide on everything.⁹ Does this mean that time is inaccessible to mind and exists independently of mind? Is this a remnant of realism amid the otherwise idealist train of thought?¹⁰ It is debatable, as in the case of Cassirer it was unclear whether he still assumed something of an absolute reality behind and external to all symbolic forms: sometimes that seems to be the case, but often not. The plethora of indirect manoeuvres in Ricoeur's argument is strongly reminiscent of Cassirer's warning, with a reference to Kleist, that it is necessary to make a 'journey round the world' to be able to determine whether there is an opening anywhere in the fabric of symbolic forms, and that perhaps this 'journey round the world' is in itself the most that can be attained.¹¹

The uncertainty that Husserl too displayed in his attempts to give time a place in his system of constitution has been noticed by many others besides Ricoeur. It is probably the most important motif in the later discussions of the phenomenology of time. To clarify Husserl's position, commentators therefore often fall back on Brentano or advance to Sartre. But not everyone is as convinced as Ricoeur of the ultimate insolubility of the problems that crop up here. An example is Manfred Frank's *Zeitbewusstsein* (1990), which offers a concise

⁹ *Temps et Récit* III, pp. 391–392; *Time and Narrative* III, pp. 273–274.

¹⁰ Cf. a passage in Rescher, where he notes that the inadequacy of our knowledge is one of the strongest indications that an external world exists independently of us: *A System of Pragmatic Idealism*, vol. I, p. 274.

¹¹ See pp. 179–180.

and clarifying historical survey of the phenomenology of the consciousness of time, in principle concentrating mainly on Brentano, Husserl and Sartre, but with incisive references to the early Romantic philosophers Fichte, Novalis and Schelling. This treatise also reviews a few other synthetic studies.¹²

Manfred Frank looks for a solution to the problems, the frictions or even the antinomies, in realism. He cautiously explores the possibilities, and hesitantly concludes that the supposition of a real time seems to be compatible with the transcendental programme.¹³ The same tendency was more evident and programmatic in Peter Bieri's *Zeit und Zeiterfahrung* (1972), in which the author dealt with the problems of the reality, objectivity and subjectivity of time from a language analytical, physico-empiricist and phenomenological perspective. He used McTaggart's distinction between the A and the B series as a recurrent reference point. The book is a critical discussion but also an attempt to arrive at a synthesis of the approaches mentioned, and it ends up as a powerful defence of real time. On the basis of an analysis of Husserl's reflections on the consciousness of time in particular, Bieri argues that the experience of time means that the reality of time cannot be denied. After all, this experience takes place in time itself, so that its analysis inevitably leads to acceptance of the reality of time.¹⁴ Husserl's dilemmas and contradictions were understandable in the light of his premises, but nevertheless there was a solution just around the corner in the acceptance of the reality of time.

Husserl's reflections came in for criticism of a different kind from Derrida. He considered that Husserl's attempt to extend the present of perception a little by means of the primary memory is doomed to failure. The present is no more than a point, and each step towards the past abandons the preserve of the original, absolute certainty and is thus a question not of presentation but of representation.¹⁵

Strictly speaking that does not abolish the dependence of time on mind; it merely shifts it, as in the case of Deleuze and Ricoeur. But

¹² In particular Peter Bieri's *Zeit und Zeiterfahrung* and Jean Theau's *La conscience de la durée et le concept de temps*.

¹³ Manfred Frank, *Zeitbewusstsein*, p. 108.

¹⁴ Bieri, op. cit., p. 178; cf. p. 199. Bieri later concentrated on analytical philosophy.

¹⁵ See Derrida, *Speech and Phenomena*, chap. 5, esp. pp. 63–65.

these are not minor or innocent shifts—they are crucial modifications of the original phenomenological conception of dependence on consciousness. In addition, there is the suspicion with which this dependence itself was sometimes viewed. Of course, the position occupied by Manfred Frank is of a different order from that of Derrida or Ricoeur, but it nevertheless offers an alternative. And together they have brought it about that, with regard to the question of the dependence of time on consciousness, the phenomenological and hermeneutic tradition does not look the same at the end of the century as it did a few decades earlier.

Can the same be said of the empiricists? I do not have the impression that the dependence of the present on consciousness is opposed more strongly than before within this tradition. It is true that the new realism of the beginning of the twentieth century, which in itself has not had any evident following, survives here and there among the ranks of the empiricists. Perhaps that was particularly the case in connection with Reichenbach's approach. After him too it was argued that time is anchored in physical reality. No less a person than G.J. Whitrow, the author of the excellent standard work *The Natural Philosophy of Time*, was of this opinion, and explicitly defended the view that the moving present has a physical reality that is independent of consciousness.¹⁶ He had few followers, however, and this standpoint has not gained much support. Here, thus, the main bone of contention seems to be not the question of whether the present is dependent on mind, but (once again) that of whether this dependence entails that the present is a pure illusion or not.

The most striking text on the present is the chapter 'But what time is it *now*?' by Paul Davies in his *About Time. Einstein's Unfinished Revolution* (1995). Davies attacks the notion of the flow of time, though allowing that without such a flow, time can still display direction and asymmetry. Asymmetry is possible within the conception of block time: the arrow of time can stand still, as it were, pointing without moving. The shifting present, on the other hand, cannot be found in or from physics. By now this view is a well-known one. It can be regarded as the counterpart to one of Ricoeur's standpoints: while Ricoeur argues that physical time cannot be reached from experienced

¹⁶ On the Grünbaum-Whitrow debate see Eva Cassirer, 'On the Reality of Becoming'.

time, the empiricists argue that experienced time is unattainable from physical time. This is not Davies' last word, however, for he still speculates on their connection with the intriguing question of why now is *now*. The second, italicised now is here the personal present, the now as it is experienced by each of us, while the first is the situation of the world as we find it *now*. The question is: Why do these two coincide? Why is it just now *now*?

That now is now looks like a simple tautology, and of course it can be interpreted in that way. In that case, now is now just as here is here.¹⁷ The same statement can also be understood as a truism, a sort of cliché, that does not tell us very much; on this interpretation the word 'now' is simply taken to refer to the present situation, to what is going on at the moment. But it becomes a highly informative statement if we follow Davies in taking it to mean that the now that we *experience* coincides with the state of the world as we find it. After all, that could have been different, even if one remains with the same, real world: centuries earlier or later, for example. Davies adds some reflections in connection with the fact that it is precisely now *now*, and what this can teach us about ourselves and the world. In that case, however, the experienced now gradually disappears from the picture, for the question ultimately becomes that of why humanity has appeared in this fragment of the cosmic block time. So this does not affect the subjective character of now at all. Even a natural philosopher as enterprising as Davies does not question that. He does, however, refuse to accept Smart's conclusion that the experience of the moving now is an illusion. The penultimate chapter of his book makes that clear. The experience of the flow of time and of the moving present 'is something so basic to my experience of the world that I am repelled by the claim that it is only an illusion or misconception'.¹⁸ He prefers to assume that our knowledge of time is incomplete, and he regards the attempts by Eccles and Penrose to explain the flow of time on the basis of quantum

¹⁷ Cf. R.M. Gale, 'Is it now now?', where it is argued that this question can only arise when the necessary conditions for a successful temporal communication have not been satisfied because the participants have divergent temporal perspectives. He concludes by subscribing to the commonsense view that the shared temporal perspective is based on that of nature itself: the distinction between present, past and future exists independently of us in reality.

¹⁸ Davies, *About Time*, p. 275.

mechanics as among the most interesting research on time that is going on at the moment.¹⁹

While the dependence of the present on mind has remained relatively uncontested among empiricists, a different form of dependence on mind has even been given a new, powerful impulse. This is the asymmetry of time, the fundamental difference between the directions prior-posterior and posterior-prior. The contribution of natural science is less unambiguous on this point than in the case of the present. It is true that the fundamental natural laws are symmetrical in time and that in theory all movements are possible in the opposite direction, but there is an elementary particle, the neutral kaon, which was discovered in 1964 to behave asymmetrically in time. There is also a connection between the possible asymmetry of time and other presumed asymmetries such as those of the quantities of matter and anti-matter. Moreover, there is the overwhelming asymmetry of macro-phenomena, even though they are the result of numerous irreversible micro-phenomena. Davies discusses all these aspects, and has no doubts about the physical basis of the asymmetry of time, the physical difference between earlier and later. The powerful impulse referred to above is thus not in evidence in his case.

That impulse can be found above all in Huw Price's *Time's Arrow and Archimedes' Point* (1996), in which Price shows with a wealth of detail to what extent the notion of a physical temporal asymmetry is based on partiality. He discusses in depth the work of many physicists and cosmologists who have concerned themselves with the direction of time, from Ludwig Boltzmann via Wheeler, Feynman and Thomas Gold to Penrose and Hawking, and tries to show how influential a certain bias has been. In almost every case, he argues, the phenomena have been interpreted in such a way that *our* direction from past to future was favoured so that it emerged from the argument as *the* direction of time. He persistently advocates a non-partisan position, that is, an objectively non-temporal standpoint, a standpoint outside time, 'the view from nowhen'. There is reason, he believes, to suppose that in that case cosmic time will prove to be symmetrical. Temporal asymmetry would be exposed as our work, the result of how we look and think.

¹⁹ Ibid., p. 278.

Price repeatedly refers to the influence of our perception and our consciousness in relation to other temporal aspects too, but he avoids speaking of illusions in this connection. He does so less emphatically than Davies, and goes nothing like as far as Thomas Nagel, who presents the world in *The View from Nowhere* as consisting not only of material things but also of personal consciousness and the corresponding points of view. Nagel thus recognises a subjective reality in addition to objective reality: 'Reality is not just objective reality'. Nagel's 'view from nowhere' thus has its limitations, more clearly than Price's 'view from nowhen'.²⁰ This has implications for how the reality of time is understood as well. Unfortunately Nagel hardly discusses this issue, but time is bound to be fully real in his view, including its progression and the personally experienced now, even though they are subjective and dependent on mind.²¹

At the same time, Price also maintains a distance from those who have no qualms about emphasising the illusory character of time. The most controversial of them all at the moment is Julian Barbour in his book *The End of Time* (1999). According to Barbour, the real world consists of an infinite number of coexistent configurations called Nows. These Nows or moments are completely static, but many of them are configured in such a way that they elicit the illusion of a past and of temporal progression. So time does not exist, only the illusion of time: 'the instant is not in time, time [i.e. the illusion of time] is in the instant'.²² Barbour envisages a new scientific revolution that will lead to the abolition of the concept of time.

These are a few of the recent developments that take up themes covered in the preceding chapters, but the picture is in need of completion in one important area. Although I have deliberately not drawn the boundaries between the tendencies under review in too clear-cut a way, there are a few blank spots left. In particular, the contributions of the analytical philosophers have not yet been mentioned, with the exception of their predecessors Russell and Moore, Dummett's reaction to McTaggart and their role in Peter Bieri's reflections. Yet some of them have been intensively concerned with the philosophy

²⁰ Nagel, *The View from Nowhere*, ch. II; the citation is from p. 26.

²¹ This emerges from a note on p. 57; cf. p. 59. Further remarks bearing on time can be found on pp. 130–134.

²² Barbour, *The End of Time*, p. 53.

of time, and the topic has come up repeatedly during the last few decades.²³

As one would expect from analytical philosophers in the sense intended here, their interest was primarily directed towards the role of time in everyday language. The verbal tenses, of course, were an important component of this material, but that was by no means all. Analytical philosophers studied the function of temporal expressions, the relations between them, and the notions that they represent; they investigated what they sometimes called the grammar of those expressions and in a wider sense their use. *The Language of Time* and *Language and Time* are characteristic titles.²⁴ More in particular, there was Wittgenstein's call to eliminate philosophical puzzles by consistently taking into account what we say and do in our everyday life. He also believed, it is true, that philosophical puzzles can arise because we are misled by what we say, but the remedy in that case was primarily to keep our expressions within the appropriate limits. Our dealings with time could be conceived as a language game too, one played according to specific but subtle and context-bound rules.²⁵ Others opted for formalisation, leading to the development of logics of time: formal systems intended as an exact explication of the content and use of temporal expressions. This branch of logic matured rapidly. As already advocated in 1941 by J.N. Findlay, it was often practised in connection with the modal logic that had been developed earlier.²⁶ In addition it was widely applied in the study of temporal expressions in linguistics. This logic of time has in principle two forms: the logic of past, present and future, and the logic of prior and posterior. Opinions differed on which of the two is the most fundamental and on their relation to one another.²⁷

²³ For a general orientation see the collections Le Poidevin and Murray MacBeath (eds), *The Philosophy of Time*; Oaklander and Smith (eds), *The New Theory of Time*; and Le Poidevin (ed.), *Questions of Time and Tense. The Arguments of Time*, edited by Jeremy Butterfield, is wider in its scope. See also Turetzky, *Time*, ch. 10.

²⁴ The former, by Richard Gale, was published in 1968; the latter by Quentin Smith appeared in 1993.

²⁵ Wittgenstein himself included some remarks on time in *The Blue Book* and *The Brown Book*, preliminary studies from the 1930s for the *Philosophical Investigations*.

²⁶ Findlay, 'Time: A Treatment of some Puzzles', included in Richard Gale (ed.), *The Philosophy of Time*.

²⁷ For information on the logic of time, see Johan van Benthem, *The Logic of*

The outcomes of such formal or informal analysis are in themselves irrelevant for the problem discussed in the present work. How expressions function in relation to one another is one thing; whence they ultimately derive their meaning is something different. Language games and formal rules, of course, are dependent on conscious beings, but that does not answer the question of what would be left of time if there were no beings to play those language games and to employ temporal notions. However, analytical philosophers have fortunately not always confined themselves to such a semantic, pragmatic or logical analysis. Moore and Russell themselves were evidently interested in ontological questions, and the same is true of some of their followers. Moreover, McTaggart's claim about the non-reality of time continued to exert an influence. It cropped up repeatedly, especially among British philosophers, as a point of departure for the defence of an ontological position in which his A/B terminology was widely applied. Something of this has already been discussed in Chapter XIII, but there was much more.

The move towards an ontological formulation of the problem was a natural one. After all, once the truth of statements is at stake, the question arises of what makes our statements about time true. Some adopted the position that language games are simply played and that there is no point in inquiring further. Wittgenstein made remarks in that vein, and it is not surprising that sceptical postmodernists could appeal to him. What is true then comes to coincide with what is commonly accepted. That was not the dominant trend, however. Most of the analytical philosophers were prepared to confront assertions with facts; a growing number did not even feel any difficulty in calling the result metaphysics. The question was thus raised of which facts correspond to our statements about time. While statements about the past had already often been subjected to such an analysis,²⁸ now the problem arose more generally of whether distinct categories of facts correspond to our statements referring to past, present and future. Are there not only tensed statements, but also corresponding tensed facts? In other words, is time itself, and not just language, articulated in terms of present, past and future? Is

Time. Once again, an important initiator was Reichenbach, this time with his *Elements of Symbolic Logic* (1947), especially § 51.

²⁸ See e.g. Ayer, *The Problem of Knowledge*, ch. 4.

time itself tensed? If not, past, present and future emerge again as products of the mind, because in that case the distinction is introduced by us; if time is tensed, then they are in some way independent of the mind.

McTaggart adhered to the former position; A.N. Prior, one of the founders of the logic of time, defended the latter position. On various occasions he claimed that time-bound statements cannot generally be converted into statements about unchanging facts. The best-known occasion was the essay 'Thank goodness that's over'. An exclamation like this, according to Prior, is by no means an expression of delight at the timeless fact that the matter has been concluded at the moment of the exclamation. It is about the fact that this is the case *now* and was not yet the case a little while ago. He dealt most systematically with the issue in the essay 'Changes in events and changes in things'.²⁹ Strictly speaking, Prior argues, a reference to the past or the future is a kind of adverbial modifier of the description of the situation in the present tense; in essence, a temporal operator is added to the description of a situation.³⁰ The claim that something was formerly the case therefore says more than that the event concerned once and for all precedes the making of the statement. It also says that this fact in the past *was* the present (and is therefore past now). That is why the statement cannot be detached from the moment at which it is made. What is more, for the length of its duration, this moment comprises the whole of reality. The past is no longer, the future is not yet, only what is now exists. Prior said it in so many words in one of his last articles, 'The Notion of the Present'.³¹ The present and reality coincide; when considered in relation to past and future, the present simply *is* reality. Earlier and later cases are just as unreal as imaginary cases. But that the past has genuinely taken place and that the future will genuinely take place proves all the more that the progression of the

²⁹ The first of the essays included in *Papers on Time and Tense*.

³⁰ *Ibid.*, pp. 7–9. Cf. also *Past, Present and Future*.

³¹ Included in Fraser et al. (eds), *The Study of Time*, pp. 320–323. There were already hints of this standpoint in the essay 'On spurious egocentricity' (*Papers on Time and Tense*, pp. 15–25), where he argued that in many statements the word 'now' is redundant; see esp. p. 21, where he speaks of the 'equivalence of the "presentness of the occurring of X" with the simple "occurring of X"'.

present, and with it the A series, cannot be eliminated from our picture of the world by means of the B series.

What are the consequences of this standpoint for the question of whether time is dependent on mind? The present is now clearly independent of it and the same applies even to the progression of time. Matters are more complicated with regard to the past and the future. All that is past has ceased to exist, but we still talk about it. Do we thereby evoke it? That might be the case, but not necessarily so, for it is anyhow a fact that the past *existed*—a time-bound fact, it is true, but for Prior no less a fact for that. *Mutatis mutandis*, the same is true of the future. Precisely because the present is inexorably the only reality, the past is the past reality and the future is the future reality.

Some, such as Richard Swinburne and Quentin Smith, have tried to link up with these ideas of Prior in one way or another. They see time as ultimately articulated in terms of past, present and future. It is dynamic; without an ongoing present there would be no time, and if the reality of time is accepted, this ongoing shifting articulation is accepted too. Many, however, perhaps the majority, have taken a different path. Their main spokesman was D.H. Mellor. To be sure, he and his supporters, including R. Le Poidevin, recognised that a statement about what happened in the past says more than that this event precedes the moment at which the statement is made. It had been argued (for example by Russell at a certain stage of his career) that the meaning of such an A-statement can be expressed completely in such B-statements. This was called the B-theory. In the meantime that idea had been abandoned and replaced by the so-called *new* B-theory, the new tenseless theory. This theory recognises that an A-statement can entail more than any B-statement whatsoever. That surplus, however, is taken to be irrelevant for the truth of the statement. What makes an A-statement, just as well as a B-statement, true or false—according to this theory—is only the unchanging succession of the events and the place of the event once and for all on an objective time scale. Time in itself is thus not dynamic but static. The dynamism is the result of our temporal position, our shifting temporal perspective. It is a subjective surplus, an artefact of ourselves without actual substance, inevitable and practically even extremely useful, but not anchored in the world. McTaggart was right: the A-series of past, present and future is unreal. But he was wrong when he concluded that time is therefore unreal too. For

the B-series of prior and posterior, of objective points in time and objective duration, can exist by itself and guarantees, according to this view, the reality of time.

The prominent book was Mellor's 1981 publication *Real Time*. In 1998 he published a second version, *Real Time II*. In essentials nothing had changed, but on a number of points the argumentation was developed or modified. There was also a new reaction to Prior's 'Thank goodness that's over'. Of course, Mellor maintained the view that its explication does not require any A-facts and that B-facts suffice, but the crux of his solution concerned the role of what the speaker thinks: his belief that the painful situation is over. Beings like us simply think in terms of past, present and future. Besides, these A-opinions may be completely correct, but that is so because of B-facts (in Prior's case: that the painful situation precedes the relief). In the end, it is B-facts that cause and justify A-beliefs and A-feelings.³²

The standpoint defended by Mellor and his supporters converges with the one adopted by most of the empiricists. Although the latter argued on the basis of physics, the conclusion was the same: that present, past and future, unlike the relations of prior and posterior, depend on consciousness. In both cases there is also the same room for differences of opinion on the purport of this dependence on consciousness: is the experience of the present and the flow of time pure illusion or more? And in both cases, of course, the question also arises of where this experience comes from.

Mellor has tackled this question, as J.J.C. Smart and others had done before him. Mellor's explanation follows on from his solution to Prior's problem. The experience of the flow of time, according to him, is based on the constant changing of our beliefs: our opinions concerning the external world, specially concerning what is taking place now and what is happening to us now. 'These changes embody the psychological truth in the metaphysical falsehood that time flows', he says.³³ These changes (or rather, differences) must generally speaking be well-founded, otherwise we would not have kept up the struggle for survival. But that well-foundedness is only based on the ever valid, unchanging B-facts. So 'our undeniably real experience of time flowing gives us no reason to think that it flows

³² Mellor, *Real Time II*, pp. 40–42.

³³ *Ibid.*, p. 66.

in reality'.³⁴ Illusion? Mellor avoids the bold word, and it would not fit in with his argument either, for although he does not recognise A-facts he does recognise true A-beliefs and true A-claims. Nevertheless, the present and the flow of time are here entirely dependent on a thinking being, that is, one endowed with consciousness.³⁵

In other respects too the views of the analytical philosophers sometimes resemble those of some of the empiricists. For instance, they are also concerned with the problem of the direction of time. Naturally the increasing entropy played a role here.³⁶ But the question of whether the arrow of time could be derived from causality surfaced again as well. Mellor thought it could,³⁷ and the same view has been defended in several publications from the 1990s, such as Richard Teichmann's *The Concept of Time* (1995) and Michael Tooley's *Time, Tense and Causation* (1997). Both of them discuss again the problems and arguments that had been adduced earlier by McTaggart, Prior and Mellor, though they arrive at very different conclusions.³⁸ Teichmann defends the dynamic standpoint that is anchored in our use of language (he disagrees with McTaggart's argument that the A-series leads to contradictions and with that of the Mellorians that the B-series yields the only, or at any rate fundamental, facts), while Tooley tries to adopt an intermediate position by combining aspects of the static and the dynamic standpoints. In his view, the static B-facts are fundamental, but they do not exist once and for all. They come into being at a certain moment; new B-facts are constantly appearing in the present. Indeed, the future does not yet exist; he deduces that from causality too.

It can be seen from this survey that the dependence of time on mind has had its ups and downs in analytical philosophy. It has disappeared altogether for Prior; in his case, all aspects of time seem to be anchored in external reality and the corresponding facts. For

³⁴ *Ibid.*, p. 69.

³⁵ For yet another explanation of the experience of the flow of time, see Butterfield, 'Seeing the present', in Le Poidevin (ed.), *Questions of Time and Tense*, pp. 61–75.

³⁶ An example is the article by Lawrence Sklar, 'Up and Down, Left and Right, Past and Future', included in Le Poidevin and McBeath (eds), *The Philosophy of Time*, pp. 99–116.

³⁷ See the two versions of *Real Time* and the article 'Causation and the Direction of Time'.

³⁸ The topicality of McTaggart's argumentation can be seen from Gerald Rochelle's 1998 study *Behind Time. The Incoherence of Time and McTaggart's Atemporal Replacement*.

Mellor and his followers, on the other hand, it reappears in its familiar guise: past, present and future are dependent on our consciousness. Teichmann's position seems to be reminiscent of Prior's at first, but that is not really the case. His orientation towards language goes so far that idealist consequences emerge. His whole argument about the scope of the temporal perspective is based on suspicion regarding the notion of a reality that is external to language and mind.³⁹ He is one of those philosophers who are wary of speculations beyond the boundaries of language and who continue to regard the use of everyday language as the decisive arbiter in philosophy. His Priorian conclusion therefore has no connection with the Priorian reality of the present, but is based solely on the way in which we can express ourselves. He argues that genuinely tenseless talk is impossible, which means that the temporal perspective cannot be avoided in language. This is not just compatible with the dependence of that perspective (and a good deal more) on mind; it essentially coincides with it as long as one joins Teichmann in not even being prepared to countenance the possibility of something *not* dependent on mind.⁴⁰

Michael Tooley, on the other hand, has moved considerably towards a realist position. Right from the first paragraph of the first chapter of his book it is clear that he is interested not just in language but in the world itself: what is at stake is the choice of a dynamic or a static conception of the world. He opts for the former: for him the world is in itself dynamic in time; present and past are real independently of any observer; the future does not exist. Repeatedly he asks himself whether a certain conception applies to our world. Conceptual analysis is not enough: 'conceptual analysis [. . .] tells one only about the conceptual framework that one possesses; it provides no grounds for concluding that the world in fact conforms to that framework'.⁴¹ He therefore takes the menace of a conflict between his views and Einstein's special theory of relativity very seriously and does his utmost to devise a solution. Finally, he has a fully realist conception of the relation of causality, and sees causation as forming the core of temporality. In his final remarks he concludes: 'in

³⁹ Teichmann, *The Concept of Time*, pp. 18–19.

⁴⁰ Quentin Smith displays a similar aversion to such a 'metaphysical' approach in his *Language and Time* (1993).

⁴¹ Tooley, *Time, Tense, and Causation*, p. 248. The remark is primarily directed against Quentin Smith; see previous note.

grounding the dynamic nature of the world upon causation, the present approach entails that time, understood as involving the coming into existence of events, is a totally objective feature of the world that is not dependent in any way upon the experience of humans, or other conscious (or self-conscious) beings'.⁴² The most that one might say is that the future as such is a product of the human mind.

And so the twentieth century came to an end with a powerful argument for the mind-independency of time from the analytical school. However, there is no reason at all to regard this as the last word, not so much because the following century has already begun, but above all because Tooley's position was already attacked in the twentieth century.⁴³ His book is certainly important and instructive, with incisive commentary on many issues, but it remains debatable whether the middle course he advocates is feasible. It might be the case that the contradictions between the static and the dynamic standpoints are irreconcilable. It might also be the case that the daring exploit of an alternative to the theory of relativity does not help Tooley. This alternative introduces an absolute simultaneity and thereby abandons the constant speed of light. Tooley says of the latter postulate that it 'has no experimental support, and [...] may even be untestable in principle': the experimental confirmations, it is alleged, are confined to to-and-fro situations, as already in the tests by Michelson and Morley.⁴⁴ Recent reports, however, actually indicate a striking empirical confirmation of that principle for a one-way trajectory. Tooley's own absolute simultaneity (with the corresponding absolute separation of past and future) is certainly no formal addition without physical consequences,⁴⁵ but a fully-fledged physical concept, with all the obligations entailed thereby.

⁴² Ibid., p. 377. Huw Price even called Tooley's view of causality, which had been set out in an earlier book, 'hyper-realist' because it concerns aspects of physical reality that go beyond physics; cf. Price, *Time's Arrow*, pp. 154 and 276. For a concise presentation of Tooley's position, see his article 'The Metaphysics of Time' in Jeremy Butterfield (ed.), *The Arguments of Time*, pp. 21–42.

⁴³ See esp. the reviews by Quentin Smith in *The Philosophical Review*, 1999, pp. 123–127 and by L.N. Oaklander in *Mind*, 1999, pp. 407–413; cf. also Mellor, *Real Time II*, pp. 81–83.

⁴⁴ *Time, Tense, and Causation*, p. 340. Tooley does not want to tamper with this constancy either.

⁴⁵ This is true, however, of the proposals of Nataša Rakić in 'Past, Present, Future, and Special Relativity', a summary of her University of Amsterdam Ph.D. thesis.

Physics has thus come to play a part in analytical philosophy, as it had done earlier in a number of other tendencies. In fact there are many more sciences at stake. Time is a widely discussed topic within a broad field of research more than it has ever been before. Besides physics and the related disciplines of astronomy and cosmology, a good many other sciences have devoted attention to time and made contributions to which philosophers could make meaningful responses. Examples are biology, neuroscience, psychology, linguistics, literary theory, cultural anthropology and sociology. Researchers in these fields were often able to continue the work of their predecessors. A wide-ranging and in-depth survey of the work of these predecessors, both philosophers and scientists, can be found in G.J. Whitrow's *The Natural Philosophy of Time*.⁴⁶

An idea of the interest in the study of time can also be gauged from the foundation of the International Society for the Study of Time in 1969, which also functioned as a powerful new impulse. The transactions of the first large-scale conference were published in 1972.⁴⁷ By no means everything that was investigated or claimed then and later is relevant for the specific problem of time and mind: the meaning of time in separate branches of science, whether time is infinitely divisible or not, biological clocks, literary time-structures, the subjective consciousness of time, the social role of time, etc. Apart from a few digressions in Chapter IX, this book has focused on the philosophical problem of the existence of time in relation to mind and consciousness. Moreover, it is about the *history* of this problem. That in itself already makes it undesirable to devote excessive attention to the last thirty years by comparison with the last thirty centuries. It would be improper to bury past ideas under present ones. Nevertheless, there is one further recent development that has not yet been mentioned and that can certainly not be left out: the contribution from sociology and the reaction to it from philosophers.

This development was set in motion by Norbert Elias with his *Über die Zeit* (1984), which appeared in English as *Time: An Essay*. Of course, he was not the first sociologist to concern himself with the

⁴⁶ On the psychology of time see also Hede Helfrich (ed.), *Time and Mind*.

⁴⁷ Fraser, Haber and Müller (eds), *The Study of Time*. There have been twelve such conferences in the meantime.

sociology of time, for all kinds of aspects had been touched on in earlier sociological studies. Even the notion of time as such had been tackled in connection with such questions as how people deal with time or the social meaning of time. Steps in that direction can already be found in the work of a number of classical sociologists: Emile Durkheim, Georg Simmel, and Max Weber. Others followed in their footsteps, particularly in those of Weber.⁴⁸ Still, Elias was probably the first to draw explicit attention to the role of social life as a fundamental factor in time and the notion of time in their widest sense, to raise the question of the relation of this to other approaches, and to offer a critical discussion of philosophical views such as Kant's.⁴⁹

Starting from the primary importance of social timing, Elias presented the effect of social institutions (especially in connection with religion and agriculture) as the basis for the evolution of both our present sense of time and the physical notion of time, taking them to be a product of social time. That the modern sense of time turns out in this analysis to be a part of the civilising process that Elias has described in so much detail is not surprising, but in this connection it is more important that he attempts to show how even physical time is rooted in social life.

In the Netherlands Johan Goudsblom, who had already been inspired by Elias in other respects, followed in his footsteps in his treatment of the social dimension of the notion of time.⁵⁰ But the question of how essential this dimension is remains unanswered. Is Elias merely describing a historical development, or does this development reveal something about the ontology of time? Is the social dimension only the first articulation of a natural phenomenon, or is it the essential foundation of the notion of time, as Elias suggested?

⁴⁸ For a critical discussion of several variants of the sociology of time, see Barbara Adam, *Time and Social Theory*. Sandro Segre, 'A Weberian Theory of Time', is an illuminating account of the implications and consequences of Weber's sociology of time. The importance of Durkheim is raised by William Watts Miller in his article 'Durkheimian Time'.

⁴⁹ A few years after Elias, Thomas Luckmann also made an attempt to throw light on the notion of time from a sociological perspective in his article 'The Constitution of Human Life in Time', but his ambitions were more limited. Remarkably enough, he did not even refer to Elias' essay, although he did mention several other key contributions to the sociology of time (esp. pp. 151–152).

⁵⁰ Goudsblom, 'The Worm and the Clock'. The remarks on p. 22, third paragraph, are particularly relevant here.

And in that case, does this inevitably lead to the conclusion that time is a social construction? That puts the dependence of time on mind back in the foreground, with strong connotations of relativism and arbitrariness; more in particular, it leads to the programme of social constructivism.⁵¹ A good many attempts have already been made in this vein to reduce facts, theories, categories, patterns of behaviour and attitudes to the status of products of social mechanisms. Might they get their hands on time too? Is there room, after Andrew Pickering's *Constructing Quarks* (1984) and everything that followed it, for a book on the social construction of time? Have the constructivists in principle already overtaken the 'Eliatics'?⁵²

These questions are bound to interest some philosophers. A few of them had already pointed out the existence of a social dimension within time of their own accord, especially when the role of inter-subjectivity in the formation of the notion of time or of time itself was at stake. Nicholas Rescher, for example, noted incidentally but forcefully that 'communication about temporal matters requires the connecting linkage of *common* experiences, and accordingly endows time with an inherently social dimension'.⁵³

When matters became serious, however, the philosophers had little to say. D.H. Mellor included Elias' essay in the bibliography of his *Real Time II* and that was quite something, for he did not mention Whitrow, Rescher, Deleuze, Ricoeur or Davies, for example, but he did not discuss it, and most other philosophers did not pay any attention to the sociology of time either. They rarely rose to the sociological challenge. If one bears in mind that in the past there were repeated references to psychology and that natural science was taken into account throughout the whole of the previous century (not everywhere and by everybody, of course, but over a wide front), then the suspicion arises that this is one of the loose ends in the problem of time and mind at the beginning of the twenty-first century.

⁵¹ Sometimes, for example in the case of H.R. Maturana, it has a clear biological character; in such cases one could speak of biosocial constructivism.

⁵² For an alphabetical list of twenty-four social (re)constructions that have already been undertaken, see Hacking, *The Social Construction of What?*, p. 1. Time is missing from the list. Time only crops up incidentally in the rest of the book, although Kant is presented as one of the most important precursors of contemporary constructivism. The book is an extremely valuable discussion of this trend.

⁵³ Rescher, *Conceptual Idealism*, p. 125.

Generally speaking, there have been a good many reactions to the recent attempts to undermine the belief in objective reality and objective knowledge. These attempts were numerous enough too, and social constructivism represented only the extreme of a tendency with many branches. A robust opponent was J.R. Searle with his *The Construction of Social Reality* (1995). Searle here distinguishes between brute physical facts and mental facts. Some of these mental facts are intentional, some intentional facts are social, some social facts are functional, and some of these are institutional. The latter are based on social agreements, and there is a social status function at work here. Obvious examples of institutional facts are facts concerning money, property, marriage and citizenship. This is the category in which Searle is primarily interested in this book.⁵⁴ To which category do temporal facts belong?

Searle opens his account with an example of a language-dependent and thus mental fact: 'Today is Tuesday the 26th of October'. His motivation is as follows: 'the features in virtue of which today is Tuesday the 26th of October cannot exist independently of a verbal system, because its being Tuesday the 26th of October is a matter of its relation to a verbal system'. That is the major difference from, for example, 'This is a cat'.⁵⁵ The fact in question is also a social fact, but it is not an institutional fact because there is no status attaching to the Tuesday or to this date. That would apparently be different in the case of a statement that today is Christmas Day or New Year's Day.

Time only crops up incidentally in the rest of the discussion.⁵⁶ The book concludes with a vigorous defence of what Searle calls external realism: the view that the world largely exists, whatever properties it may have, independently of us: 'there is a way that things are that is logically independent of all human representations'.⁵⁷ He holds the conventional arguments against this position to be untenable, and on the positive side this is the essential presupposition of our mutual communication. In short, there are brute

⁵⁴ For the full diagram of its categories and sub-categories, see the table on p. 121 with the explanatory comments.

⁵⁵ Searle, *The Construction of Social Reality*, pp. 64–65; cf. p. 166.

⁵⁶ E.g. on pp. 156 and 158.

⁵⁷ *Ibid.*, p. 155.

physical facts; not all facts are mental and a fortiori they are not all social, let alone functional or institutional. Indeed, these mental facts form only a small fraction.⁵⁸ Moreover, the fact that they are, ontologically speaking, subjective does not mean that they can only be described subjectively. They can just as well be the object of objective knowledge. In this vein Searle explicitly rejects social constructivism.⁵⁹ Although he barely mentions time in this connection, it seems, in the light of his examples and the tenor of his argument, that he classifies the temporal facts of nature as brute physical facts. Measures and other concepts may be chosen and produced, but the facts concerned are not. The facts of the calendar, on the other hand, proved to belong to the category of social facts; they are 'socially constructed'.⁶⁰

What about the facts of present, past and future? Searle does not mention them, although his only detailed temporal example might have led him to do so. After all, it was a matter of the day and the date of *today*. The example was carelessly chosen; the fact that a person is born on a certain day or date would have been less hazardous. Still, that is the example he chose, and it seems revealing that Searle did not suspect any snake in the grass here. Take the fact that it is raining today. Meteorological phenomena count as brute physical facts for Searle, but is it a brute physical fact that it is raining *today*? In other words, does this fact exist independently of our mind and its representations? It is certainly no institutional or functional fact, and is possibly not a social one either, but there are reasons to suppose that, according to Searle's system of classification, it must be a mental fact. According to those reasons, it is not simply today, but it is today because a conscious being experiences it or states it to be so. What would Searle make of those reasons? His failure to comment on the 'today' of his own example probably means that he does not recognise them, and that the fact that it is

⁵⁸ Moreover, they do not form a world of their own parallel to that of the pure physical facts, but are individually or collectively designed and produced by conscious beings within the only world there is. Searle is no dualist when it comes to body and mind. In that sense the mental facts, although they are not brute physical facts, are physical in a wider sense of the word. See *ibid.*, pp. xi–xii and 122; cf. *The Rediscovery of the Mind*.

⁵⁹ For this rejection see esp. pp. 183 and 190–194.

⁶⁰ For this term, see e.g. p. 194.

raining today is a brute physical fact in his eyes, a fact that exists independently of language, mind and consciousness. The same probably applies to 'yesterday' and 'tomorrow'. So there is here no solution à la Mellor nor any restriction à la Prior or Tooley, but an unconditional realism à la Moore: bracket every consciousness and not only does the rain remain what it was, but today also remains today, yesterday yesterday, and tomorrow tomorrow. That, at least, is what Searle appears to have meant.

Searle's reaction to the idea of time as a social construction thus remains to a large extent implicit. The most explicit philosophical reaction is perhaps that of Edo Pivcevic in the chapter 'Objectivity and the social construction of time' of his book *What is Truth?* (1997). Pivcevic concedes a lot. He recognises that conditions of objectivity are always context-bound; he claims that real time can only be objective time in the sense of time objectively known; and he concludes that the notion of an objective temporal ordering cannot be detached from the notion of history, a notion that in turn is a social one and is determined by the perspective of past, present and future. He sums it up as follows: 'If there is a "real time", then it is only in the sense of an objective historical time, and the objective historical time is a *socially constructed time*'.⁶¹ What nature in itself has to offer, strictly speaking, is a natural ordering of the events in a determinate series. This ordering only acquires a temporal character from the historical perspective that is attached to it, and that is not only essentially mental but also essentially social. The latter insight is an important contribution by the constructivist approach. All in all, there is still a limited natural basis for the social construction of time. According to Pivcevic, the shortcoming of social constructivism with regard to time is its failure to realise this. If we say that something happened at a determinate moment in history, we are also saying that it occupies a determinate place in that natural ordering.⁶²

⁶¹ Pivcevic, *What is Truth?*, p. 116.

⁶² *Ibid.*, p. 127. Pivcevic's analysis is a reaction to the social constructivist approach without mentioning names except those of the precursors Hegel, Marx and Mannheim.

EPILOGUE

One or more centuries ago it might have seemed that the problem of Time and Mind had in principle been solved: by Newton around 1700, by Kant around 1800, and by Bergson around 1900. That this was mere semblance could be seen at the time too; with hindsight it has become patently clear. By now, around 2000, there is no longer even a semblance. Nevertheless, it is very tempting to suppose that the history of this problem must be moving towards a certain conclusion at this magical moment, and if not at this moment, at any rate in the twentieth century taken as a whole. It is difficult to resist the automatism of this expectation. Let us bear in mind Thomas Nagel's wise comment: 'as if the present age were not just another in the series'.¹

In fact, the question of whether, how and in which respects time is dependent on consciousness or mind is still an open question today. The discussions of it are in full swing. There are still plenty of open options from very different orientations, and they are almost all serious possibilities; bizarre standpoints or perverse opinions are remarkably rare in this field, as the previous chapter should have made clear. It is likely that this plurality of opinions will continue for some time.

That plurality already existed in antiquity. At the beginning of Chapter VII I attempted to summarise its main points. The dependence of time on mind was presented in three gradations, determined primarily by the ideas of three key figures: Aristotle, Plotinus and Augustine. These three visions continued to dominate discussion in the Middle Ages and after. The Aristotelian tradition was given a certain priority in the course of the thirteenth century, but with how many variations! Later Leibniz and the twentieth-century empiricists were to continue this tradition in important respects. The Augustinian line was also continued and became even more important than ever in the modern era from Locke on. Bergson, Husserl, Heidegger, Merleau-Ponty and Ricoeur, each in his own—sometimes

¹ Thomas Nagel, *The View from Nowhere*, p. 9.

idiosyncratic—way, were to ensure that this voice was still to be heard. Even the Plotinian tradition did not disappear after the Middle Ages and the Renaissance. It survived particularly in German idealism, though the tone was set in that movement, of course, by the powerful voice of Kant, which is still influential today. Apart from Kant, other new motifs joined the chorus: through the intervention of Berkeley, for example, and increasingly from adjacent fields of science such as physics, psychology and sociology. So I would not like to suggest that the contours of the entire history described here were already sketched by around 400 AD. People may have gone round in circles for a while a millennium later, but that is certainly not the case for the subsequent centuries.

That history naturally had its decisive moments, key figures, and peaks. Besides antiquity, the period from 1250 to 1350 was another such peak, followed especially by the period from Locke to Kant, as well as the years around 1900. There are also good grounds for mentioning the latest *fin de siècle* here, and I believe that this interest will continue in the present millennium. We too who live in the present time are experiencing a period of wide-ranging interest and variegated reflections. Perhaps that is why the future development of the problem tackled in this book is not yet clearly in sight. We cannot predict which variations and new motifs will face us and our successors.

To be honest, the possibility cannot even be ruled out that, no matter how lively the debate may be at present, the topic may disappear from the philosophical agenda before long. This will not be the fault of time, for there is certainly still some thinking to be done there, but it might happen if the notions of mind and consciousness come to disappear from the philosophical vocabulary. Perhaps many expect this to happen, but I am not one of them. It is not that the attacks on the traditional notions of mind and consciousness by scholars like P.M. and P.S. Churchland and Daniel C. Dennett are unimportant, but with all the bluff and rhetoric here it would be unwise to admit defeat. On that point, despite new, brilliant research, the situation has not changed since the publication of Gilbert Ryle's *The Concept of Mind* in 1949. Functionalism and physicalism (or neurologism) have much to offer, but the claim that they can explain away consciousness and the conscious mind has by no means been proven yet. There are enough signs that indicate that consciousness and mind have lost none of their vitality as themes with a future, and

their dependence on several kinds of things by no means rules out the possibility that other factors are in turn dependent on them.

In short, Time and Mind are two subjects that are still at the centre of attention, and the combination of the two certainly does not appear to be on the decline. The problem at issue has not been resolved and the subject has not been done to death by all the discussions; new points of view will continue to emerge, as they did in the fertile last years of the twentieth century.

That said, I naturally have my own expectations concerning what is and is not likely to emerge. Although everything is still up for discussion, in some respects I think that the die has been cast. For instance, I am convinced that time does depend to some extent on mind, and that this dependence primarily concerns the present, the past and the future. Without consciousness there is no Now, without Now there can be no past or future. That the world is *now* in the situation in which it finds itself is only so because that Now is felt, thought and selected by us or by beings who think otherwise. Bracket consciousness, and you bracket the present; not a single situation in the world, including the present one, would then be the present (any more than the earth, or any celestial body at all, would then be *here*).

But that does not mean that time has disappeared as a dimension of prior and posterior, earlier and later. It is less clear in which respects precisely this dimension should still be regarded as a temporal dimension. There is room for the idea that the specifically temporal has disappeared along with the present, past and future. What is then left is the view that I called coexistentialism at the end of Chapter I: objective reality is static, and what we regard as temporally distinct basically forms part of an overarching, four-dimensional, unchanging reality.

I doubt whether this is an acceptable conclusion. Time has its peculiar properties that space does not have, and one of those is change. In this connection it is worth comparing the words 'now' and 'here' with one another.² They are both situation-bound demonstratives,

² I am referring to their function as adverbs of time and place. The word 'now' has several other functions too, particularly as conjunction and interjection, but they will not be considered here, although I shall appeal to the substantive use of 'now' and 'here'.

which means, for example, that the truth value of statements in which they appear depends on the circumstances in which they are made; in this case on the moment or on the place. They are both selective: they select a moment or period of time, in the first case, or a point or area, in the second, as the reference of the statement concerned. How large that particular time or space is depends once again on the context and the circumstances, but it remains tied to the moment or place of the linguistic utterance. That means that these two expressions are not only demonstrative and selective but also subjective and reflexive: their way of denoting and selecting is related to the speaker and to the linguistic utterance itself.³

These, in brief, are the similarities. There are differences too. The selection, for example, does not operate in the same way in both cases. As far as time is concerned, we can choose between 'now' and all kinds of forms of 'earlier' and 'presently', but not between different moments as now. As for space, not only is there room for manoeuvre between 'here' and 'elsewhere', but we also have much more freedom to determine where our here will be. Given our birth, all kinds of locations could still be here, but what our now is, is highly determined. Time itself seems to determine for us what now is, while space in no way determines what here is. In other words, we are swept along by time, while up to a certain point we have a relative freedom of movement in space. A game like puss in the corner can only be played with spatial positions.

As far as selectivity is concerned, thus, 'now' behaves in a manner closer to 'I' (another indexical) than 'here'. In the case of 'I' too, we make a distinction from others ('I don't think so'), but we do not select from among persons each of whom could be our 'I'

³ Of course, this general outline can be refined and elaborated in all kinds of ways. The philosophical literature on indexicals or demonstratives ('now', 'then', 'presently', 'here', 'there', 'this', 'that', 'I', 'you', 'they', 'we', etc.) is considerable. See e.g. the relevant articles in *The Encyclopedia of Philosophy* ('Indexical Signs, Egocentric Particulars, and Token-Reflexive Words' by Richard M. Gale) and in the *Routledge Encyclopedia of Philosophy* ('Demonstratives and Indexicals' by Harry Deutsch), as well as the collection *Demonstratives*, edited by Paul Yourgrau; specifically on time, cf. Robin Le Poidevin (ed.), *Questions of Time and Tense*. The semantics of the word 'now' is described by A.N. Prior in 'Now', and very thoroughly and extensively by Hans Kamp in 'Formal Properties of "Now"': for a summary discussion, see my article '*Hier en nu*', on which I have drawn for the following pages, though leaving out the considerations on indirect and free indirect discourse.

if we wanted them to be. We are stuck with our 'I' just as much as we are stuck with our 'now' but not with our 'here'.⁴

Matters are somewhat different when it comes to subjectivity. In this case 'now' is less personal than 'here'. It does not matter who says 'now' at a certain moment. Certainly, in theory it does not matter who says 'here' at a particular place either, but in practice there is a major difference, because the group that immediately knows which moment of time is referred to when someone uses the word 'now' is very much larger than the group that immediately understands which place is referred to when someone uses the word 'here'. It might be objected that this would be different if the same number of living persons were systematically to be found on the same place as are systematically to be found at the same moment, but that is simply not the way it is. The closest to it is to take the word 'here' to refer to the earth.⁵ That is indeed a possibility, but this word *need* not be used in that way, and such a manoeuvre is at any rate unnecessary for the word 'now'. It might also be objected that the comparison is unfair because, strictly speaking, it is not 'now' and 'here' that are being compared, but 'now' and 'here-now'. The conditions in the second case are thus in advance much stricter because all those who occupy the place in question earlier or later are left out of account, while all those who share all possible places at the same moment are taken into account. But, seen in a different light, does not this illustrate precisely the difference between the two expressions?

All in all, the intersubjectivity of the present is thus in fact much greater than the intersubjectivity of a certain place as 'here', and the subjectivity of 'now' is for that reason much smaller than the subjectivity of 'here'. If we now reconsider 'I', we see that in this case 'I' behaves more like 'here' and unlike 'now'. In a certain sense

⁴ Compare for example 'I' with 'he'. By means of gestures it is possible to say meaningfully 'Not he, but *he*'. 'Not I, but *I*', on the other hand, is nonsense. Likewise, 'Not here, but *here*' can be used meaningfully (even without the speaker moving), while 'Not now, but *now*' is (admittedly) possible because it might refer to two moments of time close to one another, but is for that very reason a different case.

⁵ Cf. P.F. Strawson, *Individuals*, p. 216: "'Now' and 'here', by themselves, set no boundaries at all; nor is it their function to introduce extensionless points or durationless instants. They merely act as pointers to some extent of space and time which they do not, by themselves, delimit'. On 'now' cf. also pp. 117–120, esp. pp. 118–119.

its behaviour is even more extreme than 'here', because there is, after all, a certain intersubjectivity of the place but no intersubjectivity of the person.⁶

These findings also have consequences for reflexivity: in so far as the word 'now' is less subjective than 'here' (and 'I'), i.e. its purport is less dependent on the speaker, it is also less bound by the linguistic utterance itself, i.e. less reflexive.

It is true that such typical differences between 'here' and 'now' have not been left uncontested. Serious attempts have been made to explain these differences away. They have been taken to seem evident while in reality they are only apparent. In reality, it has been claimed, there is a complete analogy between 'here' and 'now', and in a general sense time and space should be treated in a completely equal manner.

Two strategies have been elaborated to dispense with the differences. One puts the blame on language, the other puts it on the world. An important representative of the former strategy was W.V.O. Quine. The section on time in his *Word and Object* begins with the statement: 'Our ordinary language shows a tiresome bias in its treatment of time. Relations of date are exalted grammatically as relations of position, weight, and color are not'.⁷ Quine regards this as a reason not to ask why this is the case, but to do something about it, for he takes it to be an affront to the ideal theoretical simplicity, and he describes how a canonical language can be developed in which this exalted position of time is no longer to be found. In the second strategy, it is argued that the world has provoked the asymmetrical use of the notions of time and space, but that these are fortuitous properties, so that, logically speaking, the differences do not exist. E.M. Zemach and Jeremy Butterfield have chosen this sec-

⁶ At least, strictly speaking. Groups sometimes function more as collective units than as a collection of autonomous individuals. In those cases 'we' refers to such a collective unit rather than to a collection of individuals.

⁷ Quine, *Word and Object*, p. 170; the full title of this section is 'Time. Confinement of General Terms' (pp. 170–176). What Quine says here about the role of time and space in ordinary language may not be true of every language. See for example the remarks of Jeremy Butterfield in connection with F. Boas' account of the Native American Kwakiutl language ('Seeing the Present', p. 70). The far-reaching claims of B.L. Whorf concerning the Native American Hopi language in his well-known article 'An American Indian Model of the Universe', have (largely thanks to the work of E. Malotki) been discredited by now.

ond option. Zemach has described a possible world in which the phenomenon of 'becoming' has a spatial character ('becoming from east to west'), while Butterfield has shown which fortuitous properties of the real world have led to the quasi-objectivity of the present.⁸ Whichever direction one takes, the argument is that, upon closer examination, time and space are equivalent, and 'here' and 'now' are in essence strictly analogous.

In spite of their ingenuity, these attempts are not entirely impartial. I therefore believe that the far-reaching conclusions are not proven. The remaining differences between 'here' and 'now' have not been explained away. They are real. 'Here' and 'now' may both be selective, subjective and reflexive terms, but they are so in different ways and to different extents. Of course, our perspective on time and space is at stake here. And why not, for those perspectives also belong to reality. Our temporal perspective differs from our spatial perspective through less freedom, through the experience of being swept along, through our strongly asymmetrical knowledge. In space there is often a way back, in time there never is. On the other hand, everything is in motion in time, but not in space, although there are manifold movements in space but only one in time.

Precisely because the present is always somebody's present, it is so in the corresponding way, just as the here is always somebody's here in the corresponding way. And these two ways are not the same. We create the present in a different way from the here; in both cases we do so by becoming aware of it or giving it a name as such, but with different assumptions and consequences. As a result, the function of the now in time is not the same as the function of the here in space.

These differences are based on the role of change. Change lies in time, not space. It is true that one can eliminate some of the differences between here and now, between space and time, for example by developing a canonical language. It is also true that some of them can be considered as relatively fortuitous by deriving them from contingent circumstances. But neither of these attempts will eliminate the now as the constantly moving present. As stated earlier, there

⁸ E.M. Zemach, "Here" and "Now"; the citation is on p. 252. Jeremy Butterfield, 'Seeing the Present'. In connection with Butterfield's argument see too Donald C. Williams, 'The Myth of Passage'.

can be no *now* without a consciousness. But once the now is there, it leaves its mark on time and on temporal relations in a much more incisive manner than the here does on space and on spatial relations. The now is more intimately intertwined with time than the here is with space, and the now determines time more essentially than the here determines space.⁹ Vice versa, it is much easier to get rid of the *here* in the development of an objective notion of space than it is to get rid of the *now* in the development of an objective notion of time. Apparently time is more ours than space is. In this respect Bergson was right: it is easier to abstract from experienced space than from experienced time.

The core element of that experienced time is change. The variation that space admits is something of a completely different order from the variation that time entails. There is no spatial analogue of temporal progression, let alone an analogue that is embodied in the notion of *here* as temporal progression is embodied in the notion of *now*. An appeal to radically different worlds with radically different natural laws and conscious beings proves at most that under such radically different conditions, progression can be radically different from how we conceive it. Such alternatives prove nothing about the meaning of the now in our world, once one has accepted that it is we ourselves (and other conscious beings) who create the now.

All of this does not add up to a solution. It is rather, and at most, a defensible position; it is my assessment of how things stand. It is even connected with the formulation of a further problem, for what is the basis of this temporal progression, the necessary component of all change? It is quite conceivable that the direction of time and our awareness of its progression are in the last resort based on the causal coherence of the world—briefly, that time is, in D.H. Mellor's words, 'the causal dimension of spacetime'.¹⁰ It may be that this, in principle, is the true answer. But even if it is not, and even if efforts to find the true answer are unsuccessful, the differences between *here*

⁹ It is already revealing that some (including A.N. Prior) have defended the thesis that only the present exists, not the past or the future. Nobody, on the other hand, will imagine that only the here exists in space.

¹⁰ D.H. Mellor, *Real Time II*, p. xiii and Ch. 10. Zemach's argument about 'becoming' in a radically different world is based on a similar assumption. Another candidate in physics for the foundation of the progression of time is entropy.

and *now* must not be treated lightly. Suspicion is good and has led to many important insights; disdain goes too far.

For the rest, old and new auxiliary sciences can offer philosophy a lot in this field. The consequences of that remain unclear for the time being. Not just the past, with which this book was concerned, but also the future looks variegated. But how different! It is difficult to imagine that they coexist in a static world. The now (our now) keeps them apart.

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